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NATURE AND GOD

AN INTRODUCTION TO THEISTIC STUDIES
WITH SPECIAL REFERENCE TO THE
RELATIONS OF SCIENCE AND RELIGION

By

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TO
MY FATHER AND MOTHER

P R E F A C E

THIS volume comprises, with extensions and additions, the Alexander Robertson Lectures delivered at the University of Glasgow in October and November 1926. In making the additions, largely of historical matter, I have drawn freely, with the kind permission of the family of the late Dr. Hastings, upon my article "Teleology" in the *Encyclopædia of Religion and Ethics* (*ERE*).

The title, "Nature and Purpose," would have been an almost equally appropriate title for the book, as my central aim is to present an historical and critical study—on popular or semi-popular lines—of the fundamental concept of purpose, which has struck so deeply into the current of our Western thought, with the view of clarifying the issues as between science and religion in respect of this concept, and so of furthering the great end of the reconciliation of science and religion.

The book is also designed to be of help to younger students, especially students of theology, as an introduction to theistic studies. It will serve both to make them acquainted with some great names in the history of theology, philosophy, and science, and to direct their attention to some significant books in these domains by recent authors. With such readers in view I have not hesitated to use in places

some technical terminology. The younger student usually welcomes such guidance as technical distinctions afford, as landmarks in the history of thought. As he advances in his studies, he becomes less dependent on the terms of the schools ; indeed, as it must be allowed, if he be of vigorous or self-confident mind, he may even become impatient of them, as " but remoras and hindrances " (as Bacon said of final causes) " to stay and slug the ship from further sailing."

In seeking to vindicate a place for theistic faith even in relation to the natural world, which gives but an uncertain response at best to some theistic inquirers, I offer first a summary account of the place of natural theology in theistic thought, in which a theological attitude should appear, neither intellectualistic nor agnostic. This is followed by an exposition of the function of natural science, in which the limitations of the scientific standpoint are indicated, as admitted at least by leading representatives of the widely accepted " descriptive view." How a practical delimitation may be made between the respective spheres of science and religion¹ is then illustrated in detail with reference to cosmical theory. In transition from these more general discussions to the particular consideration of the concept of purpose, there comes a description of the order of nature as threefold, namely, the common or public order, the logical or scientific order, and the spiritual order ; and the theistic argument from order, whether based on the common or the scientific order of nature, is defended as reflecting the logic of the heart.

¹ Or, to be more precise, science, philosophy, and theology.

The way is thus prepared for the formal arrangement of the culminating discussions of the book. In the first place, the concept of purpose is examined in relation to the common order of nature, and the impression gained of purposive activity everywhere, except in the domain of the inanimate or inorganic. In the second place, the concept of purpose is examined in relation to the logical or scientific order, viewed both genetically and systematically, from the standpoints of the *How* and the *What*. The spheres of inorganic nature and organic nature are scrutinised, with a glance also at the spheres of mind or consciousness and society. Under inorganic nature the recent theory of the collocation of properties of matter is expounded, and it is considered in what sense the theory implies a natural or scientific teleology. Under organic nature the adequacy of mechanism as distinguished from teleology is considered in relation to the theory of biological descent, as also in relation to biology in general, notice being taken of the recent teleological movement in vital, mental, and even social science, whose watchword is "the autonomy of the natural sciences." In the third place, the concept of purpose is examined in relation to the spiritual order of nature. After a sketch of the history of teleological interpretation from Anaxagoras to Kant and Hegel, the endeavour is made to defend the conception of a spiritual order in the natural world, and more especially the validity of the notion of purpose in relation thereto. Then the place of purpose in current philosophy is indicated, special attention being drawn to the personalistic or humanistic philosophies of religion as pre-eminentely hospitable

able to the notion. Finally, there is offered a critical estimate of the notion of purpose as manifested in the spiritual order, concluding with the statement that the true image of God is not the pre-existent Creator of the deistic theology, nor the static timeless Absolute of acosmic pantheism, but the eternal Redeemer of the religious consciousness.

To Professor J. A. Robertson of the United Free Church College, Aberdeen, and my colleagues, Professors J. Laird, A. S. Ferguson, and G. D. Henderson, I am much indebted for ready help and valuable criticisms. To the Rev. George Ogg, B.D., B.Sc., one of my first students, I am deeply grateful for his able and painstaking assistance in correcting the proofs and preparing the Index.

WILLIAM FULTON.

KING'S COLLEGE, OLD ABERDEEN,

September 1927.

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PART I

NATURAL THEOLOGY AND NATURAL SCIENCE

CHAPTER I

INTRODUCTION

CHAPTER I

INTRODUCTION

THESE chapters, as indicated in the Preface, are based upon a course of lectures given at the University of Glasgow under the Alexander Robertson Foundation. According to the regulations governing it, the Lectureship is "in defence of the Christian religion." This is a large phrase, and, were it strictly interpreted, would involve in the first place a discussion of the nature of the Christian religion, which is a subject much debated in modern Christian theology since Harnack's epoch-marking treatment of it in 1900, and in the second place a discussion of the validity and truth of the Christian religion, also a subject much debated in our time. But my predecessors in the Lectureship have not accorded the phrase so strict an interpretation, nor was that incumbent upon them. It would have meant that each Lecturer set himself the task of traversing the whole ground of Christian Apologetics.

If, however, we think of the Christian religion—despite A. N. Whitehead's strictures upon the familiar figure ¹—as a citadel, which it is the apologist's part to defend, then obviously the work of defence may be as various as it is many-sided; and positions should be assigned to the defenders according to their several capacities. Some may be well qualified to take up posts in the citadel itself, others were better at the outworks or on the ramparts. It is on the ramparts I would take my stand, and it

¹ See *Science and the Modern World*, 1926, c. xii.

is only a watchman's duty I would seek to discharge ; and the particular avenue of approach to the citadel I would keep under surveillance is that along which modern science advances. I would report what I can discern of its movements, and offer an opinion as to whether it wears the guise of friend or foe, or, as it may be, of neutral. This, I trust, will be accepted as a sufficient piece of service by those who have summoned me to the honourable task of sharing in the defence of the citadel.

Or to revert to plain terms, I shall not attempt in these chapters to set forth the nature and to maintain the truth, or even the right, of the Christian religion, which is the complete apologetic task. Nor shall I even attempt to set forth the nature and to maintain the truth, or even the right, of religion in general, which is a necessary preliminary to that task. My subject falls, however, under the general topic of the nature and the truth of religion. An adequate treatment of this topic involves an investigation not only of religion in itself but of religion in its relations, that is, in its relations with other spheres of culture. And it is with religion in its relations with science that I would specially deal in these pages. I hope to show that there is room enough for both science and religion within our universe of experience.

We are apt at present to make too much of the differences between science and religion. Probably the majority of working scientists still take their religion as they find it, and are untroubled by any sense of deep cleavage between scientific method and results and religious faith. Probably, too, the majority of religious people now take their science as it comes to them, being untroubled, or not deeply troubled, by the cleavage in places between scientific truth and the theological tradition. Lord Balfour

even seems to suggest that it is a sign of a "contentious intellect" to trouble oneself about any of the contradictions, real or imaginary, between religion and science! ¹ If that is so, then the "contentious intellect" has largely displayed itself in recent philosophical and theological literature! But if the conflict between science and religion does not press heavily on the majority on either side—that is, of those for whom science means most in life or of those for whom religion means most—it does perturb and perplex many sensitive spirits. It is difficult for such to acquiesce in the idea that there are unresolved contradictions and disharmonies between those two great determining forces of thought and experience, and they welcome any sincere effort to discriminate between the principles of science and the principles of religion, especially when directed towards the end of furthering their mutual agreement and harmony.

It would be idle to pretend that harmony has been effected, and that science and religion are reconciled. To give up hope, however, of their ultimate reconciliation is surely not to discern the signs of the times. A hopeful sign of the times is that religion is become more willing than it once was to face change. Theologians have been recently reminded by a distinguished scientist,² that if the principles of religion are eternal, the expression of them requires continual development, and that the evolution of religion is in the main its disengagement from the associations of an imperfect science; it is, therefore, an unfortunate mistake on the part of theologians to be always on the defensive, like the garrison of a fort surrounded by enemies. They should, as this writer suggests, take a leaf out of the

¹ In the Introduction to *Science, Religion, and Reality*, 1925.

² A. N. Whitehead, *op. cit.*, c. xii.

scientists' book. When Darwin or Einstein supersedes older theories, it is declared to be a triumph for science, not a defeat. I appreciate the point, but theologians must be given the credit of being not altogether insensible to the consideration that the discipline they cultivate should show itself a progressive discipline, that it should be subject to change and development with man's developing religious life, and with the onward movement of the spiritual consciousness generally. We recognise that if religious experience is richer than theological thought, it still remains true that theological thought is organic to religion, and should be continuously influential upon it, as a factor in religious progress.

In this connection I often recall the position of a New England divine of last century, whose writings—now largely forgotten—helped to liberate many preachers and theologians among his contemporaries from the bonds of mere traditionalism. The passage from his writings I remember best, and which impressed me at the beginning of my Divinity studies, is to be found in his volume, *God in Christ*,¹ where he says: "We have still immense masses of theologic rubbish on hand, which belong to the Ptolemaic system, huge piles of assumptions about angels that have never sinned and angels that have, about other worlds and the reach of Christ's atonement there, which were raised up, evidently, on the world when it was flat, and must ultimately disappear, as we come into a more true sense of the astronomic universe." They are the words of Horace Bushnell; and they suggest a task for modern theology which it is beginning to face, but which—as we must allow to Professor Whitehead—it has not as yet properly faced, namely, the task of rewriting its doctrine of God and the

¹ P. 289.

World, and of the Last Things,¹ keeping not only Copernicus in view, but Newton and Laplace, and of rewriting its doctrine of Man also, being not unmindful of Darwin. Its doctrine of Salvation does not need to be disentangled in the same way from adventitious scientific views; on the other hand, it is illuminated and corrected by the psychological and historical sciences, so diligently studied in our modern time, and in particular by the science of religion. In a word, theology is to be recultivated throughout its entire range in the context of the grand principle of evolution, physical, organic, mental, social, and in the recultivation to become, as we may hope, a richer, fuller, and more spacious discipline.

“ Build thee more stately mansions, O my soul,
As the swift seasons roll !
Leave thy low-vaulted past !
Let each new temple, nobler than the last,
Shut thee from heaven with a dome more vast,
Till thou at length art free,
Leaving thine outgrown shell by life's unresting sea ! ”

As I took up my pen to begin the writing of the Lectures to which this book owes its origin, I happened to be seated at an open window in the Italian Riviera on a bright and warm November day. Below me great palm trees were rustling in the wind and throwing back the sunlight from their spreading leaves; underneath them, roses and carnations luxuriated, and great white chrysanthemums; while as far as the eye could reach, blue waters stretched, and the only sounds to break the stillness were the twittering of the sparrows among the foliage and the lapping of the waves upon the seashore. It

¹ Cf. W. R. Inge, *The Platonic Tradition in English Religious Thought*, 1926, p. 115.

was Nature in a most delightful and soothing mood, and as one viewed the flock of sea-birds circling round and round high above the water's edge in tireless joyous flight, one was tempted not merely to affirm the presence of God, Mind, Purpose, in the world, but even to say expressly that the Purpose manifested in the world is the happiness of the creature.

That were, however, but a narrow affirmation at the best unless man were included among the creatures. Nor were the signs awanting from the picture which spread itself that day before my eyes that man, the last and highest of the creatures, may also find for himself in the world a comfortable and happy home. From amidst the palm trees rose the walls and roofs of substantial and stately dwelling-houses, and here and there I saw people strolling or reclining contentedly in their beautiful gardens.

One nearly forgot, in the contemplation of the scene, that the happiness of the creature is qualified often by suffering and privation, and often too—in man's case—by a consciousness of moral failure and defeat, and even of estrangement from the heart of the Eternal. It was, therefore, a fitting reminder that man still seeks a country, a true home of his spirit, to descry among the palaces of his material prosperity the graceful lines of a little tabernacle of the Christian faith—a temple of the Orthodox Church it happened to be—with turrets, domes, and golden pinnacles all lifting one's heart and mind to the mysterious Beyond, where, if anywhere, the riddles of the present receive their solution.

That Purpose is manifested in nature was believed of old and is still believed to-day. Indeed, it is this belief and conviction that keeps many a man in our modern world on the side of religion. Kirsopp Lake says that the recognition of Purpose as God will be

one of the foundations of the theology of the future.¹ That the Purpose manifested in nature is the happiness of the creature, or at any rate the happiness of man, has been and is also believed. But it should also be said that there is an increasing revolt in our time against interpretations of the world in terms of happiness, even human happiness. It is urged that it is in other than merely hedonistic and anthropocentric terms that divine Purpose is to be conceived. Here, meantime, at least, let us leave the matter.

¹ *The Religion of Yesterday and To-morrow*, 1925, p. 117.

CHAPTER II

NATURAL THEOLOGY :

1. ORIGIN AND MEANING OF THE TERM

CHAPTER II

NATURAL THEOLOGY :

1. ORIGIN AND MEANING OF THE TERM

THERE are two broadly distinguishable attitudes towards the world that may be regarded as underlying or bound up with the phrase, "Nature and God." First, there is the attitude of natural theology, which looks upon the world as manifesting Mind, Spirit, Will, Purpose. Then there is the attitude of natural science, which looks upon the world as manifesting natural—as distinguished, for want of a better term, from supernatural—laws, principles, and processes. At any rate, let us put it this way to begin with.

This and the next two chapters will have to do with natural theology, and more especially with its place in theistic thought, and should serve to define a religious or theological standpoint; the three chapters following will have to do with natural science, and more especially with its domain or function as expounded in scientific theory, and should illustrate scientific method. We should then be ready to recognise the distinctive or separate rôles of science and religion in the experienced world, and in particular to estimate the validity of the concept of purpose as applied to the world of nature, as interpreted by science and religion respectively. If we may not state the relation of science to religion in Pascal's phrase, *c'est d'un autre ordre*, we may at least be able to affirm that as between science and religion a *modus vivendi* can be established.

Turning, then, to the consideration of natural theology, I might preface what I have to say on this topic with the remark that acceptance of the principle of natural theology does not necessarily mean acceptance of the natural theology, with its pre-evolutionary science, of William Paley and the Bridgewater Treatises. One is apt to regard coldly and with impatience nowadays all attempts after the manner of Paley to illustrate and enforce the argument for the being of God from the so-called adaptations of nature, as these are disclosed in detail by natural science. The particular force and point of the Paleyan argumentation rested to a large extent on the presupposition—shared, as it should be remembered, by the contemporary science—of the primordial character of the present ordered universe, and more especially of a primordial differentiation of organs and a primordial distinction of species. But inasmuch as modern science, following Laplace and Darwin, has learned to look upon the cosmos, whether of inorganic nature or of organic nature (let us retain this convenient distinction even in face of the recent scientific view of nature as organic throughout), with its parts, organs, and species, as the issue of a long process in time rather than as a primordial fact, so theology may well be acquiescent in the rejection by modern science of the older finalism, or doctrine of final causes, which, in looking for evidences of particular purpose everywhere in the natural world, tended to hinder the fuller investigation of natural processes.

After all, it is a matter of relative indifference to theistic faith whether the world has always possessed its present organisation, even in detail, or is the result of a continuous process, so long as it may be recognised as the product of the divine Mind and Will, and as interpretable, taking it as a whole, in

terms of meaning and purpose. Yet it should be added, it can hardly be a matter of indifference to the theistic and Christian thinker whether he is found to be in sympathy or out of sympathy with the positive trend of modern scientific thought. The theologian who would ignore the established results of natural science cannot be other than a voice crying in the wilderness. In this connection, Titius' important work, *Natur und Gott* (1926), may be regarded as marking an epoch. With its masterly description of the scientific picture of the universe in detail, and its able attempt to appraise its religious value, it is virtually a summons to our Protestant theology to take up once more the study of the problem of nature, to revive if in a profounder way its old interest in natural theology.

And so to our particular topic. First, we should take note of the origin and meaning of the term "natural theology." Its origin lies in the classical paganism of ancient Greece, as we may judge from a well-known quotation from the Roman antiquarian Varro, made by St. Augustine in the *De Civitate Dei*,¹ Varro's language being obviously based upon some Greek writing, perhaps by the Stoic Panætius.² It was a term with which Christian scholars and writers after Augustine's time must have been familiar, if only through Augustine's reference to it. But it was only towards the close of the scholastic era that the term came into use in connection with the Christian system of doctrine; and it was first used, so far as is known, as the title of a book when it became attached to Raymond of Sebonde's *Liber*

¹ vi. 5: "tria genera theologiæ . . . unum mythicon, alterum physicon, tertium civile." "Mythicon appellant, quo maxime utuntur poetæ: physicon, quo philosophi; civile, quo populi."

² E. Zeller, *Outlines of the History of Greek Philosophy*, E.T., 1886, p. 286; C. C. J. Webb, *Studies in the History of Natural Theology*, 1915, pp. 10, 69.

Naturæ sive Creaturarum (1434–36). This circumstance must have drawn more attention to that work than perhaps it deserved (though I understand the late Lord Acton classed it among “the hundred best books”), and helped to win for Raymond his appellation—which, as we shall see later, may only be claimed for him in a qualified sense—of “the father of natural theology.” Since Raymond’s time the term “natural theology” has become current coin. It was commonly used in England during the Deistic controversies of the seventeenth and eighteenth centuries, and through Paley’s influence it became the watchword of Christian theism in the first part of the nineteenth century. We have not heard so much of the term since then, partly owing to the recent reaction from philosophical theology, as exemplified even within theological circles in the Ritschlian movement, and partly owing to the absorbing nature of the new historical and psychological studies in religion. But there are signs of a revival of natural theology among us with the new and more hopeful relation of natural science to religion and spiritual philosophy, as witness many of the courses of Gifford Lectures, not to speak of recent works like *Science, Religion, and Reality*, or A. N. Whitehead’s *Science and the Modern World*; and with a revival of the study of natural theology, there may be a revival of the use of the term itself, even among scientists and philosophers.

As for the meaning of natural theology, it would be hard to better Bacon’s account of it as “that spark of knowledge of God which may be had by the light of nature and the consideration of created things.”¹ The meaning of natural theology becomes still clearer when we recall the historical associations of

¹ *De Augm.*, iii. 2: “talis scientiæ scintilla, qualis de Deo haberi potest per lumen naturæ et contemplationem rerum creatarum.”

the term. In the classical paganism, as we see from Varro's reference, natural or physical theology was contrasted with civil theology, as being the philosophical or scientific type of theology¹ as distinguished from the popular or national type. In the mediæval scholasticism natural theology was contrasted with revealed theology, as being the philosophical or rational as distinguished from the revelational type of theology. Now there was something common to the civil theology of the ancient world and the revealed theology of the Middle Ages. It was the historical, or pseudo-historical, factor. Civil theology may be justly named historical theology, inasmuch as it comprised the positive ordinances of the popular religion and the narratives concerning the local or national gods. Revealed theology was also an historical form of theology, inasmuch as it comprised the positive ordinances of Christianity and the record of historical events associated with Christian belief and worship. Thus when we consider natural theology in its past relationships we find that the contrast involved in the phrase is virtually the contrast between the natural, or the scientific, or the rational, and the historical.

It is a misapprehension of this contrast that we meet with in traditional Christian theology, with its distinction and division between the natural and the revealed—a distinction and division, it is interesting to observe, tacitly accepted even by a writer like Sir J. G. Frazer, who in his Gifford Lectures understands by natural theology “the conception which man, without the aid of revelation, has formed to himself of the existence and nature of a God or gods.”²

¹ “The doctrine about things divine taught by philosophers as an integral part of their account of φύσις, *natura*, reality” (A. E. Taylor, *Plato: the Man and his Work*, 1926, pp. 489–490).

² *The Worship of Nature*, 1926, p. 13.

The knowledge of God derived from the consideration of nature, or from the light of reason, is as much entitled to be called revealed knowledge as the knowledge of God mediated through the Scriptures and the Church. In matters of religion at any rate, as H. W. Gwatkin, for example, used to insist, knowledge and revelation are correlative terms, as expressing two sides of the same thing. Man's discovery of God for himself and God's discovery of Himself to man accompany each other. "The divine and the human are always both implied" in religion; "and we can no more have the one without the other than we can have the north without the south, or a circle without a centre."¹ Or as Clement Webb has put it: "Only so far as it is *known* is any religious truth properly *revealed*. Nor *can* it be known except through revelation, unless we suppose that we can, like Actæon or Prometheus in the fables, surprise or steal the secret of God against His will."²

A truer contrast than that between natural and revealed theology is then the contrast between natural and historical theology. We come nearer to the meaning of natural theology when we say that whereas natural theology has to do with the universal truths of religious philosophy, historical theology has to do with the special truths of a particular religion.

But it was a mistake of the eighteenth-century Deism or rationalism to suppose a clear delimitation possible between natural theology, as treating of the universal truths of religion, and historical or—as it was, and is still, named—revealed theology, as treating of the truths of a particular religion. So insistent indeed was its emphasis on natural theology that it would often have dispensed with historical theology altogether. God, freedom, and immortality—to cite the famous trilogy under which Kant subsumed

¹ *The Knowledge of God*², 1907, i. 156, 157.

² *Op. cit.*, p. 36.

the "rational theology" of his age—these, it affirmed, are the universal and essential ideas of religion, and they discover themselves to us when from the historical religions we abstract all the specifically Jewish, Christian, and heathen elements. But the notion of such a universal core of religion is now recognised as only the figment of a narrow unhistorical dogmatism. What A. W. Benn says of Cicero's natural religion or theology is applicable to the natural theology of the *sæculum rationalisticum*, as Mark Pattison named the eighteenth century: "Nothing more unnatural"—that is, remote from primitive notions—"has ever been devised."¹ The cardinal ideas of the so-called universal religion were the issue of a long and slow moral and spiritual ascent on the part of mankind. Nor do they always appear even in developed religions. Clement Webb makes this point more emphatically, in one instance at least, than I should be inclined to do, but let it stand: "Buddhism has no God, Calvinism denies free-will, immortality was not taught in the earlier books of the Old Testament, nor accepted by the Sadducean school of Judaism at the beginning of the Christian era."² In fact, just as it would have been impossible, humanly speaking, for the "self-taught philosopher" of the old Muhammadan romance³ to attain unto the perfect philosophy behind the symbols of the religion of the Qur'ân as he is represented as having attained unto it, namely, while confined to the desert island on which he had grown up; so it would have been similarly impossible for the Deistic and rationalistic philosophers of the eighteenth century to enunciate their formulas of natural religion had they been cut off from the spiritual nurture they received through Christendom.

¹ *History of Rationalism*, 1906, i. 60.

² *Op. cit.*, p. 38.

³ See Note appended to this chapter.

The "religion of nature" which the English Deists formulated was no more than Christianity itself, "as old as the Creation." It was even dependent on that historical theology which it so often despised, and would have so readily set aside, as merely a "republication," with spurious and "mysterious" accretions, of so-called universal religion.¹ The philosopher of the age of rationalism was inclined to think that he could in native independence excogitate for himself universal truths of religion, as the spider—to adapt a famous reference of Bacon—spins everything out of its own bowels, whereas, unknown to himself, he exercised a "middle faculty" like the bee, gathering from abroad.

In fairness it should be added, that it was not only the Deists and rationalists who entertained the notion of a universal core of religion. Said Bishop Butler, and he may be taken as representative of other orthodox Christian writers besides himself (and he has had successors in recent times like Pater W. Schmidt): "It is certain historical fact, so far as we can trace things up, that this whole system of belief that there is one God, the Creator and moral Governor of the World, and that mankind is in a state of religion, was received in the first ages."²

NOTE

IBN TUFAIL

THE reference on p. 19 is to the *Hai ibn Yaqzan* ("the Active one, the son of the Vigilant") of Ibn Tufail (called Abubacer by scholastic writers), a famous essay in natural theology

¹ Cf. Matthew Tindal, *Christianity as old as the Creation, or the Gospel a Republication of the Religion of Nature*, 1730: John Toland, *Christianity not mysterious, showing that there is nothing in the Gospel contrary to Reason nor above it, and that no Christian Doctrine can properly be called a Mystery*, 1696.

² *Analogy*, I. vi.

which has been frequently translated from the Arabic. Edward Pococke's Latin translation made in 1671, and again in 1700, was entitled *Philosophus Autodidactus*, "the self-taught philosopher." Ibn Tufail is said to have been born early in the twelfth century at the little Andalusian town of Guadix, and to have died at Marocco in 1185. He was celebrated as a physician, a mathematician, a philosopher, and a poet. *Hai ibn Yaqzan*, his sole surviving work, is a philosophical romance. Its scene is laid in two contiguous islands. On one of these is set human society with its conventions, on the other a human individual. A man, Asal by name, living in the first island, rises to the rational knowledge of divine things, and crosses to the other island, thinking it to be uninhabited, that there he may live his life in solitary contemplation. But he encounters Hai ibn Yaqzan. Now Hai had been born on the island without father or mother. He had been suckled by a gazelle. Living among the animals, and under the influences of nature, he gradually acquired a knowledge of the world around and above him. Distinguishing between matter and forms, and considering the beauty of the world, he rose to the thought of One in whom all forms are to be found, who moves the world and sustains it in being, and is Himself the alone good and perfect. Finally, he reached the stage of being united to Him, in the state of ecstasy. He was fifty years of age when Asal came to the island. He learned speech of Asal and was instructed in religion. And then the great discovery is made that the truths taught by religion and philosophy are absolutely identical, except that in religion they are presented in forms more readily understood of the people, as in the anthropomorphisms of the Qur'ân and its symbolical descriptions of the future life. Though Hai had never heard the Qur'ân chanted, nor visited a mosque, he was already a perfect Moslem. Hai was anxious to turn the inhabitants of the island opposite from their darkness to light. Accordingly, he and Asal crossed over, but he made no headway in his missionary endeavour, and returned to his island with Asal, to live the contemplative life there until the end of his days. Many little touches in this work, remarks Dr. T. J. de Boer, show that Hai was intended to represent "humanity as it stands outside of revelation." He is "the personification of the natural spirit of mankind illuminated from above :

and that spirit must be in accordance with the prophet-soul of Mohammed when rightly understood, whose utterances are to be interpreted allegorically." See S. Munk, *Mélanges de Philosophie Juive et Arabe*, 1859, pp. 410-418 ; T. J. de Boer, *The History of Philosophy in Islam*, E.T., 1903, pp. 181-187 ; D. B. Macdonald, *Muslim Theology*, 1903, pp. 252-256 ; cf. also *Religions of the Empire*, ed. W. L. Hare, 1925, p. 484 f.

CHAPTER III

NATURAL THEOLOGY :

2. ITS PLACE IN THEISTIC THOUGHT

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As we pass from the consideration of the phrase "natural theology" in its origin and meaning, let us ask, What is the root principle or grand presupposition of natural theology? Subjectively stated, it is the principle of the natural capacity of the human mind to reach a true knowledge of the being and character of God. Objectively stated, it is the principle of the actual revelation of the being and character of God in the natural world, and more particularly in the physical universe. It may be observed that the first of these definitions of the principle of natural theology speaks of the "knowledge of God," and the second of the "revelation of God," and that the two phrases are correspondent and largely complementary. It is in keeping with the position already stated, that in religion knowledge and revelation are correlatives. The principle of natural theology, it may be further observed, may be distinguished from the rational processes by which the effort has been made to expound it. It is one thing to recognise the truth of natural theology, another thing to express that truth in logical or rational forms of thought. In the sequel we shall keep this distinction in view. But it is no hard-and-fast distinction; and in tracing the history of the principle of natural theology we shall find ourselves in touch with the historical *a posteriori* proofs or arguments that infer

God from the universe, especially from the world of nature.

First let us consider the place of natural theology in the Bible. The principle of natural theology seems to pervade the Old Testament, receiving noble and sublime expression in the Prophets, the Book of Job, the Book of Proverbs, and the Psalter. The heavens and the earth are acknowledged to be the creation of God. From Him their beauty and order are derived ; and they show forth His wisdom, power, and goodness. All life, too, including man's life, comes from Him, nor apart from Him does anything live. Nor does He only create and preserve the world, He also governs it according to His mind and will. To His purposes in providence for the creatures, and more especially for man, all the processes of nature are subservient. Fire and hail, snow and vapours, and stormy wind fulfil His word. He causes the grass to grow for the cattle and herb for the service of man. He sends the rain and fruitful seasons. His warnings are in the voice of the thunder, His arrows of destruction in the lightning flashes, and the swarming locusts proclaim the day of His wrath.

Yet, strictly speaking, there is no independent principle of natural theology in the Old Testament, even as there is no abstract thought of nature as a whole. Though the natural is recognised in the Old Testament as revelational of the divine being and character, the approach to God is not in the first instance through the natural. First, God is apprehended spiritually, in moral and religious experience, and then His being and character are acknowledged as discernible in the natural world. The movement of Israel's thought is from the power and grace of God experienced in individual lives and in the national history to the interpretation of nature as also

revealing Him. As A. B. Davidson says, the position assumed is "not this : Contemplate nature, and you will learn from it, both that God is, and what He is ; but rather this : You know that God is, and what He is ; and if you contemplate nature, you will see Him there—the heavens declare the glory of God." ¹

Sometimes, however, the revelation of God in nature is represented as serving to throw light upon His true character. It is more than a God already known that we behold in nature ; through the contemplation of nature the conception of God may be corrected and heightened, as in Isa. xl. 25–26 : "To whom then will ye liken me, or shall I be equal ? saith the Holy One. Lift up your eyes on high, and behold who hath created these things." Or, as in Ps. xciv. 7, 9 : "They say, The Lord shall not see, neither shall the God of Jacob regard it. . . . He that planted the ear, shall he not hear ? he that formed the eye, shall he not see ? " ²

When we turn to the New Testament we find there also a seemingly clear recognition of the principle of natural theology, objectively regarded. It receives notable expression in the Parables of Jesus and the Sermon on the Mount, where it gives shape to spiritual messages, founded upon ordinary scenes and incidents—the shepherd on the hills, the sower by the wayside, the village wedding, the homecoming of the prodigal, the resplendent vesture of the lilies. But here also, it should be noticed, the approach to nature is through the gate of the spiritual, through Jesus' filial consciousness of the Father. Deeply sensitive as Jesus was to natural impressions, he discerned the Heavenly Father in the outer world as knowing Him first within.

For St. Paul also it is, in this reference, first the

¹ *The Theology of the Old Testament*, 1904, p. 78.

² Cf. A. B. Davidson, *op. cit.*, p. 79.

spiritual, and then the natural. None the less it is on the common ground of natural religion that he bases his appeal to the Gentile world, bidding the people of Lystra ¹ turn from their heathen deities to the living God, the Creator of heaven and earth, who cares for men in providence; and the people of Athens ² rise above their idolatrous conceptions of the Godhead to a true conception of Him who made the world and all things therein, who gives to all life and breath and all things, and who rules and governs the nations of mankind. Further, it would appear that the principle of natural theology finds nowhere in Scripture more definite philosophical or theological expression than in Rom. i. 20: "The invisible things of him from the creation of the world are clearly seen, being understood by the things that are made, even his eternal power and Godhead." Or, as Sanday and Headlam paraphrase it in their Commentary: "Since the world has been created His attributes, though invisible in themselves, are traced upon the fabric of the visible creation. I mean, His Power to which there is no beginning and those other attributes which we sum up under the common name of Divinity." It is a disputed point whether we have here the complete principle of natural theology; namely, the revelation in nature of both the existence and the character of God, it being regarded by some as dubious whether Godhead or Divinity (*θειότης*) includes the divine being or existence as well as the divine attributes. In any case, in these Pauline passages are embedded the principles that were to receive formulation in later Christian thought, as determined by Greek influences, in the rational or logical arguments now known as the cosmological and teleological "proofs," the former being the argument founded on the principle of causality, or, to state it

¹ Acts xiv. 15-17.

² Acts xvii. 24-29.

otherwise, from the contingency of the cosmos to a First Cause, and the latter the argument from the order and intelligibility of the world to an intending or designing Mind.

Although the principle of natural theology is not found as an independent principle in our canonical Old Testament, it is recognised, as might be anticipated, in the later Jewish theology, which came under the influence of Greek thought and its abstract view of nature. The principle is set forth in the Book of Wisdom xiii. 1-9, where the being and character of God appear to be represented as directly revealed in the nature of the world; see especially verse 5: "From the greatness of the beauty even of created things in like proportion does man form the image of their first maker." In the more developed thought of Philo the principle receives definite and striking expression, showing the movement of thought—characteristic of Hellenism rather than Hebraism—from the natural to the spiritual, or, as Philo expresses it, "from below upwards." After the manner of Aristotle he compares the world to a well-regulated city, and describes its beauty, order, and harmony; then he refers to those who, being impressed with the beauty of the world and its admirable arrangement and contrivance, have arrived, reasonably enough, at the conclusion that these things did not come into being spontaneously but were the work of some maker, the Creator of the world, and that there must needs be a providence. "For it is a law of nature that the creative power must take care of what has come into being. But these admirable men, superior to all others, have, as I said, advanced from below upwards (κάτωθεν ἄνω), as by some heavenly ladder (διὰ τινος οὐρανίου κλίμακος), by a probable inference guessing at the Creator from His works."¹

¹ *De Præmiis et Pœnis*, 7.

Coming now to Greek thought, we find that the principle of natural theology was widely accepted, and was influential in the philosophies of Plato and Aristotle, of the Stoics and the later Platonists, who—speaking generally—were all impressed by the existence, order, and beauty of the universe, and sought the ultimate explanation in a rational or intelligent divine source, whether conceived as transcendent or as immanent.

Plato may be said to have been the founder or creator of natural theology, because of his conviction expressed in the tenth book of the *Laws*, that there are certain truths about God which can be conclusively proved. In particular he sought to demonstrate that God is, that He is good, and that His rule is just. The demonstration turns on an analysis of the notion of movement (*κίνησις*), the most universal characteristic of things. There are two kinds of movements—the movement which can only move other things (communicated movement), and the movement which can also move itself (spontaneous movement); and the first kind is causally dependent upon the second kind. Now a thing which can move itself possesses soul (*ψυχή*); or in other words, soul is the movement which can move itself. Wherefore the movements of soul, desires, plans, purposes, are prior to bodies and bodily movements and are indeed their origin and source. Moreover, as good souls produce orderly movements, and as the great movements of the universe show regularity and order, the one perfectly good soul (*ἀρίστη ψυχή*) must be the supreme cause of the universe, and, as being perfectly good, must govern the universe wisely and justly.

In this form of argumentation the divine transcendence is safeguarded, and the immortality or indestructibility of the soul—as taught in the *Phædrus*—is involved or implied; and it may be further

noticed that the representation of the world as an effect due to soul as cause and of the orderliness of the world as the result of conscious purpose involves the principles of the two arguments aforementioned, the cosmological and the teleological.

Let me here remark that in this general treatment of the place of natural theology in theistic thought I do not seek to trace the history of the various theistic arguments. I am content simply to indicate the sources of the classical and standard arguments and to state the principles involved in them, so as to provide a setting for the argument in which these expositions and discussions culminate, namely, the teleological argument, at the heart of which the concept of purpose lies.

Aristotle follows closely upon Plato in this matter of natural theology, inferring the existence and goodness of God from the facts and events of the universe, but is not content to ascribe all movements to their origin in the movement which can move itself, postulating an unmoved, as distinct from a self-moved, mover upon whom all movement depends. The unmoved mover is not a soul ($\psi\upsilon\chi\acute{\eta}$), but a mind or intelligence ($\nu\omicron\upsilon\varsigma$), and he moves the universe by being an object of appetite ($\delta\rho\epsilon\acute{\xi}\iota\varsigma$) to it, being himself unaware of the existence of the universe. Thus for Aristotle God is, and is good, but the idea of His providential rule disappears. Which leads A. E. Taylor¹ to remark that, as Plato was the founder of philosophical theism, Aristotle may be said to have been the founder of philosophical deism. Certainly the unmoved mover is comparable to the deistic "absentee God," and it is not without significance that as deistic theology probably encouraged the naturalistic explanation of the universe, so Aristotle's thought probably receded more and

¹ *ERE*. xii. 264b.

more from the theological or metaphysical and became more and more concentrated upon a naturalistic philosophy of reality.

The Stoics, who made much of natural theology, differed from Plato and Aristotle in emphasising divine immanence rather than divine transcendence. Like the Platonists they asserted divine providence, but in a deterministic or fatalistic sense. But their distinctive contribution to natural theology lies in their appeal to innate ideas or common notions (*κοινὰ ἔννοιαι*), which are ideas or notions that accompany the normal development of intelligence, and among which belief in God stands out clearly.¹ Their doctrine of innate ideas or common notions provides the basis of yet another theistic argument, the so-called historical argument, or the argument *e consensu gentium*; and, as already hinted,² it links the Stoics through Cicero with the English Deists.

In Neo-Platonism God is no longer thought of as a soul, as with Plato, or even as a mind or intelligence, as with Aristotle, but is represented as the Good or the One, who is "beyond being." As the Good He is the final cause, as the One the first cause, of all that is. But while the One is linked to the actual world by the principle of causality, it is in no mere temporal sense that God is the first cause. In the theory of causality developed by Plotinus, Proclus, and the other representatives of the Neo-Platonic school, causes and effects do not form a merely temporal sequence. The cause of a thing is the ground not only of its existence or actuality but also of its essence or character; so that the effect is similar to its cause, and exists in its cause, only—as the scholastic writers put it—"in a more eminent manner." With the aid of this theory of causality

¹ Cf. Cicero, *De Nat. Deorum*, ii. 4, 5.

² See p. 19.

the Neo-Platonists were able to predicate qualities of Him who is "beyond being." In an analogical sense they could attribute to Him a quality such as goodness, while convinced that His goodness could not in strictness be represented in the language of time and sense. And we are told that so influential was the natural theology of the Neo-Platonists, as thus developed *per analogiam*, that it "provided the philosophical basis for the Christian theism of the whole Middle Ages."¹

Partly under the influence of the Bible, and partly—but more largely—owing to the place it held in Greek thought, the principle of natural theology entered from the beginning into the tradition of the Christian Church, appearing in the Fathers and later in the Schoolmen, and being caught up afresh in the age of the Protestant Reformation.

The Greek Apologists and Fathers, who in the interpretation of nature developed the doctrine of the Logos further, and the Latin Fathers also, were impressed with the order and beauty of the world as manifestations of the being and character of God. This principle is clearly acknowledged in the first extant Christian Apology, that of Aristides, which begins thus: "I, O King, in the providence of God came into the world; and when I had considered the heaven and the earth and the sea, the sun and the moon and the rest, I marvelled at their orderly arrangement. And when I saw that the universe and all that is therein are moved by necessity, I understood that the mover and controller is God."²

¹ A. E. Taylor, *ERE*. xii. 266b; cf. F. Picavet, *Esquisse d'une Histoire des Philosophies Médiévales*², 1907, c. v., "Les vrais maîtres des philosophes médiévaux."

² From the Greek text in *Texts and Studies*, ed. by J. Armitage Robinson, 1891; for translations of both the Greek and the Syriac version, see D. M. Kay in *Ante-Nicene Christian Library*, Additional Volume, 1897.

The principle might also be illustrated from the works of the other Apologists and of almost every patristic writer. Says St. Augustine: "Not only does the authority of the divine books declare that God is; but the whole nature of the universe itself which surrounds us, and to which we also belong, proclaims that it has a most excellent Creator."¹ "If we look attentively," says St. Gregory, "at outward things, we are recalled by them to inward things. For the wonders of the visible creation are the footprints of our Creator. Himself as yet we cannot see, but we are on the way that leads to vision, when we admire Him in the things that He has made. And so we call the creation His footprints, since by the things that are derived from Him we are guided to Himself."²

The principle of natural theology is also acknowledged on the subjective side in the ancient period of the Church. Augustine's contrast between the light of nature and the light of grace (*lumen naturæ*, *lumen gratiæ*) illustrates his belief, shared by the Fathers in general, that by "searching" we may find out at least something concerning God. It set the problem upon which the dialectical effort of the Schoolmen was chiefly directed, of the reconciliation of Greek philosophy and Christian doctrine.³

The idea of the divine self-revelation in nature, which is the objective principle of natural theology, might also be illustrated from the writings of the Schoolmen. We gain glimpses too of the feeling for created things among the Schoolmen "on the dainty

¹ *De Trin.*, xv. 4.

² *Greg. Mag., Moral.*, xxvi. 12. In *Divine Immanence*, 1903, c. ii., J. R. Illingworth gives a number of passages from non-Christian as well as Christian literature to illustrate the religious influence of nature.

³ For some passages illustrating the high estimate of reason in the apologetic and patristic ages, see J. R. Illingworth, *Reason and Revelation*, 1902, pp. 2-4.

pages of illuminated books, in the choice of sites for monastic houses and hermits' homes of prayer, in the countless legends of tender sympathy between the animals and holy men." ¹ J. R. Illingworth also cites the well-known hymn of St. Francis of Assisi, the "Canticle of the Sun," as perhaps the best expression in mediæval literature of the poetry of nature. This is, as I say, the recognition of the principle of natural theology on the objective side.

On the subjective side, the principle is maintained in the Middle Ages by such writers as Anselm and Abelard, Peter the Lombard, Thomas Aquinas and Duns Scotus, who carried forward the rational Platonic-Aristotelian tradition. For them, the natural light of reason is derived from the uncreated light of God Himself, by whom it is directed and controlled.

It should be noticed that Anselm distinctly enlarged the scope of the argumentation associated in ancient and mediæval times with the principle of natural theology, by formulating, in the *Proslogion*, his *a priori* or ontological argument (which has been traced back to Sextus Empiricus), in which he seeks to show that the existence of God is a truth which, while it may be derived *a posteriori* from the principle of causality and from the universal order and regularity, is also immediately apprehended, apart from the facts and events of the universe. From the very meaning of the concept of God we may legitimately infer His real existence. For God—here the influence of Neo-Platonism on Anselm may appear—is "that than which no greater can be conceived" (*quo maius cogitari nequit*), and to say He does not exist is a contradiction in terms. To make such a statement is to possess a conception of God as "that than which no greater can be conceived," and yet at the

¹ *Divine Immanence*, p. 37.

same time to conceive of a greater than "that than which no greater can be conceived," namely, something which exists in reality and not merely in thought.

At the beginning of the scholastic era, let us now notice, the distinction between natural and revealed theology, which rested upon the Augustinian contrast between nature and grace, had not emerged; no line of demarcation was drawn between the two. For all their speculative activity neither Anselm nor Abelard distinguished between the knowledge of God given in nature and that given in the Christian revelation. An offered explanation is that Anselm and Abelard were not forced like the later Schoolmen to face the problem of the diversity of religious beliefs, with its suggestion of a common stock of religious knowledge independent of the diversity. This problem became a pressing one when in the thirteenth century a renewed study of the Greek philosophy became possible, and more especially of the works of Aristotle which treated of the being and nature of God. Accordingly, we find Thomas Aquinas, in deference to the authority of Aristotle, formulating a clear and rigid distinction between natural and revealed theology, with a delimitation of their respective spheres. In the fourth book of the *Summa Contra Gentiles*, he says there are two kinds of knowledge of God possible to man in this life: the first, that obtained by the natural light of reason; the second, that derived from a revelation of God Himself, transcending reason. Thus, to cite the central instance, the natural light of reason gives the truth of God's existence and unity, the Christian revelation that of the Trinity in unity. So that through the influence of the Greek natural theology, and in particular of the Aristotelian tradition, Christian thought reached in Thomas Aquinas a

dualism of reason and revelation—a practical, not a theoretical dualism, revelation being regarded as above but not contrary to reason (*supra sed non contra rationem*).

The general position is well reflected in Dante's lines, where the poet makes his *confessio fidei* before St. Peter :

“ I in one God believe ;
One sole eternal Godhead, of whose love
All heaven is moved, Himself unmoved the while.
Nor demonstration physical alone,
Or more intelligential and abstruse,
Persuades me to this faith : but from that truth
It cometh to me rather, which is shed
Through Moses ; the rapt Prophets ; and the Psalms ;
The Gospel ; and what ye yourselves did write,
When ye were gifted of the Holy Ghost.
In three eternal Persons I believe ;
Essence threefold and one ; mysterious league
Of union absolute.”

After St. Thomas, the natural capacity of the human mind to attain the knowledge of God was so emphasised by Raymond of Sebonde as to make for the resolution of the Thomist antithesis between reason and revelation, and to give natural theology a place all its own in the theological system, apart from and independent of revealed theology. Clearly Raymond was not the first to cultivate natural theology. Not to go beyond European thought, it was cultivated, as we have seen, by Plato and Aristotle, the Stoics and the later Platonists, by Christian Fathers and mediæval Schoolmen. But, so far as is known, he was the first among scholastic writers to break with the Thomist tradition, in its spirit at any rate, and to exalt and glorify the power of reason and the natural knowledge of God. This he did notably in the Prologue to the *Liber Naturæ*,

¹ *Paradiso*, Canto xxiv. (Cary's translation).

and that was probably the reason why the Prologue was eventually placed on the Index.¹ It is a long way from Raymond to Hegel, but the pious adventure of thought on which Raymond launched, in which he essayed to cross the traditional line between the natural and the revealed in theology and to challenge the dogma of the double truth, found a climax and consummation in the Hegelian view of the Trinity, as the most rational of all doctrines and, as such, the quintessence of all truth.

But to compare Raymond with Hegel is to compare the simple with the profound, not to say the mediæval with the modern. An apter comparison is to hand, on the objective as distinguished from the subjective side of natural theology. When I think of Raymond and his *Liber Naturæ*, I recall a writer of our own country and of a later age, a physician also by profession, who also found joy and felicity in the contemplation of the book of nature, and, like Raymond, summons us in this our day to the recultivation of natural theology. Says Sir Thomas Browne, in language similar to Raymond's, but more eloquent and vigorous : " There are two Books from whence I collect my Divinity ; besides that written one of God, another of his servant Nature, that universal and publick Manuscript, that lies expans'd unto the Eyes of all, those that never saw him in the one, have discovered him in the other : this was the Scripture and Theology of the Heathens ; the natural motion of the Sun made them more admire him, than its supernatural station did the Children of *Israel* ; the ordinary effects of nature wrought more admiration in them, than in the other all his Miracles ; surely the Heathens knew better how to joyn and read these mystical Letters, than we Christians, who cast a more careless Eye on these common Hieroglyphicks,

On Raymond, see further the Note appended to Chapter IV.

and disdain to suck Divinity from the flowers of Nature.”¹

In the Reformation era the Roman Church adhered to the principle of natural theology as embodied in the Thomist tradition, treating of natural theology as the preamble—that is, the presupposition and ground—of faith (*preambula fidei*); a position endorsed by the Vatican Council of 1870: “If any one shall say that the one and true God, our Creator and Lord, cannot be known certainly, through those things which have been made, by the natural light of human reason: let him be anathema.”

In the Lutheran Church, on the other hand, natural theology received, in the first period of the Reformation, but scant and unsympathetic treatment. This may be gathered from the writings of Luther himself and the earlier editions of Melancthon’s *Loci*, in which it is represented that reason was smitten with blindness at the Fall and deprived of its natural capacity of knowing God. With so dark a view of human nature when separated from the grace of God in Christ, the tendency was to minimise natural theology and to emphasise revealed or supernatural theology. Accordingly, we find Luther even maintaining that to trust in reason is to forswear the faith and to seek alliance with a vain and quarrelsome termagant, a devil’s concubine.

“It is significant,” remarks A. C. M’Giffert, “that the contrast which Luther drew between the Christian God and the God of natural theology was not the traditional contrast between a personal father and the abstract absolute, but between a gracious

¹ *Religio Medici*, pt. i. p. 20 f. (text as in 1682 edition, edited by W. Murison, 1922).

and an angry God. The latter alone is known apart from Christ.”¹

The anti-rational or anti-philosophical tendency is also evident in Melanchthon, especially in that first edition of the *Loci* on which Neo-Lutheranism sets so much store. But with the revival of his humanistic sympathies as he passed beyond the personal influence of Luther, and in particular with his new-found appreciation of Greek philosophy and of patristic and mediæval theology, Melanchthon made room for natural theology within the theological system. For example, in treating of the first *Locus*, the doctrine of God, he examined the rational foundations of the doctrine in the light of Plato and Aristotle and of the speculative thought of the Middle Ages.

It may be here observed that the Socinian rejection of natural theology was not due to any theory as to the effects of the Fall upon human nature, but rather to a positivist or agnostic view (what R. Flint² would have named a religiously agnostic view) as to the natural capacities of the human mind.

In the Reformed Church, as my old teacher, Dr. William Hastie, loved to recall,³ the principle of natural theology was frankly and fully recognised from the beginning. Zwingli held that through our natural faculty of knowledge we may certainly attain to the truth of God's existence and unity, though he was far from subscribing to the doctrine of the efficacy and all-sufficiency of reason for salvation; the knowledge of Christ must be superadded to the natural knowledge of God. Calvin, while less readily drawn aside into the field of speculative inquiry, in this having more affinity with Luther,

¹ *Protestant Thought before Kant*, 1911, p. 50.

² In *Agnosticism*, 1903, p. 259 f.

³ *Theology of the Reformed Church*, 1904, pp. 182-189; *Theology as Science*, 1899, pp. 75-82.

was yet of the same view. He affirmed that all men had the seed of religion (*semen religionis*)¹ implanted within them and might recognise God in His works of creation and providence. It was a more moderate view than Luther's that these leaders of the Reformed Theology held as to the effects of the Fall.

The position of Zwingli and Calvin was vigorously maintained by their successors in the Reformed Theology, and nowhere did it receive more explicit or more exact statement than in the well-known opening sentence of the *Westminster Confession of Faith*: "Although the light of nature, and the works of creation and providence, do so far manifest the goodness, wisdom, and power of God, as to leave men inexcusable; yet are they not sufficient to give that knowledge of God, and of his will, which is necessary unto salvation: therefore it pleased the Lord, at sundry times, and in divers manners, to reveal himself, and to declare that his will unto his Church." Or, as it is expressed in *Physicke for the Soule* (1615), by Bishop Abernethy of Caithness: "[God] may be knowne by this naturall Theologie and light; as also by the sight of the creatures. But hee cannot bee knowne by this light and sight, as a father reconciled to man in Christ; which is onely got by the supernaturall light, sight, and divine Theologie. By the Naturall we are led, as by a Pedagogue, to know God, his Godhead, Goodnesse, Wisedome, Power, Providence, some articles of our Faith, and ten Commandements: and so fitly prepared to bee taught by the supernaturall Theologie."²

Since the Renaissance and the Reformation, natural theology has been cultivated by the philosophically minded more and more independently of

¹ *Institutes*, I. iii. 1, I. v. 1.

² P. 45 f. (2nd ed., 1922).

the Christian theological system. As it attached itself to that system in the early centuries of Christianity, so it detached itself again in the post-Reformation age. Usually the detachment was chiefly for the sake of convenience of treatment, and not from any spirit of antagonism to the traditional religion. It was felt too that natural theology was worth cultivating for its own sake, apart from the question of sufficiency for salvation.

One of the most notable studies in natural theology in the seventeenth century came from within the famous group of Cambridge Platonists, who sought in an unspiritual age to uphold the banner of spiritual religion. This was Ralph Cudworth's *The True Intellectual System of the Universe* (1678); and it was followed early in the eighteenth century by another notable study, namely, Samuel Clarke's first course of Boyle Lectures entitled *A Demonstration of the Being and Attributes of God* (1704).¹ Cudworth reached his theistic position through a refutation of the "fourteen arguments of atheism"; Clarke maintained his, with great logical acumen, in the form of "twelve propositions" in the manner of Euclid. Both drew freely upon the theistic inheritance, including the Anselmian *a priori* proof, both in its original form and in the form in which it appears in Descartes' fifth *Meditation* (an analysis of the idea of God the supremely perfect Being shows that it includes the perfection of existence). As Cudworth's work emanated from a great religious movement, so Clarke's came from a great scientific movement. Both works had numerous precursors and successors. The common feature of all such works, whether coming from the religious or

¹ Useful accounts of these two works are to be found in W. R. Sorley's *A History of English Philosophy*, 1920.

the scientific side, was their recognition of natural theology as a true basis of revealed theology.

F. J. Powicke ¹ has recently drawn attention to the similarity between Richard Baxter and the Cambridge Platonists—in their respective attitudes to natural theology. Like the Cambridge Platonists, Baxter steeped himself in such ancient writers as Plato and Aristotle, Cicero and Seneca, not to speak of the Italian Platonist Marsilio Ficino (who lived a generation later than Raymond of Sebonde), and it is not surprising to find him also maintaining the rational principle in theology. In the manner of Benjamin Whichcote he writes: “God hath made Reason essential to our nature: it is not our weakness but our natural excellency, and his image on our nature.” ² “Faith is an act, or species of knowledge: it is so far from being contrary to reason that it is but an act of clear elevated reason.” ³ And he reminds us especially of John Smith in his assertion of the objective principle of natural theology: “Think but what a wonderful fabrick he hath made of all the orbs, composed into one world! and can you possibly have narrow thoughts of his goodness? He hath placed more physical goodness in the nature of one silly bird or fly or worm than human wit is able to find out.” ⁴ And the following passage, as Powicke says, is of almost lyrical eloquence: “This is the life which we should labour in continually, to see God’s goodness in every lovely sight, and to taste God’s goodness in every pleasant taste, and to smell it in every pleasant odour, and to hear it in every lovely word or sound; that the motion may pass on clearly without stop, from the senses to the mind and will, and we may never be so blockish as to gaze on

¹ *The Reverend Richard Baxter under the Cross*, 1927, p. 238 ff.

² *The Reasons of the Christian Religion*, p. 259.

³ *Ibid.*, p. 259.

⁴ *Ibid.*, p. 97.

the glass and not see the image in it ; or to gaze on the image, and never consider whose it is ; or to read the book of the Creation, and mark nothing but the words and letters, and never mind the sense and meaning.”¹

Sometimes, however, as in the English Deistic movement, the detachment of natural theology from the Christian theological system has been due to a reaction from traditional Christianity and a regress upon natural religion, so called. John Toland, in his *Nazarenus, or Jewish, Gentile, and Mahometan Christianity* (1718), minimised the difference between essential Christianity and other religions ; while writers such as Collins, Woolston, and Tindal, virtually dispensed with the traditional religion altogether, setting up the light of nature as the sole standard of truth.

At the end of the eighteenth century and in the earlier part of the nineteenth, natural theology was cultivated from within the Christian tradition with unparalleled zeal. The new impulse to its cultivation is said to have been a revulsion from Hume's *Dialogues concerning Natural Religion* (1779), in which, as we shall see later, the old theistic argument from design was subjected to acute and serious criticism. The classical work of the movement in England is Paley's *Natural Theology* (1803). The Bridgewater Treatises, eight in number, which appeared between 1834 and 1840, dealt further with natural theology, which was virtually identified with the argument from design.

¹ *The Reasons of the Christian Religion*, p. 108.

CHAPTER IV

NATURAL THEOLOGY :

3. THE POST-KANTIAN SITUATION

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Two influences have tended to discredit the natural theology of Paley and the Bridgewater Treatises. The first is Kant's criticism of the speculative natural theology as a whole, and in particular of the classical theistic "proofs"; the second is the Darwinian principle.

Kant was for long in sympathy with the effort of "rational theology," as he named it, believing that the existence of God is demonstrable on rational or logical principles. Like Descartes and Locke he based his demonstration chiefly on the principle of causality—the Neo-Platonic *a posteriori* argument—which demands an explanation of the world as given, or—to put it more technically—affirms the necessity of an actual ground of real possibility. Yet the last words of *The Only Possible Proof of the Being of God* (1763) prepare us for a modification of his views: "It is very necessary that one should be convinced of God's existence; but not so necessary that one should prove it." As Kant advanced in age he became dubious of the claim of the old speculative theology, and in the *Critique of Pure Reason* (1781) he launched his famous attack upon it. Reviewing the theistic argumentation in all its various forms, as it was developed in Greek philosophy and by mediæval and modern Christian thinkers, he finds that it can be reduced to three typical or characteristic arguments, and that these are each and all fallacious.

As A. E. Taylor has summarised the Kantian classification and criticism: "We may attempt to prove the existence of the 'most real being' entirely *a priori* (*i.e.* without the use of any 'truth of fact' as a premiss) by arguing that existence is included in its very nature—the ontological proof; we may, departing from the strictly *a priori* method, employ the single truth of fact, 'something exists,' as one of our premisses, and then argue to the conclusion that a 'necessary being' exists—the cosmological proof; we may include among our premisses specific assertions about the character of the 'something that exists'; *i.e.* we may argue from the marks of intelligent and benevolent design in the actual world to intelligence and benevolence in its source—the physico-theological proof. Each of these is now to be shown unsatisfactory. The first is a pure verbal sophism and the second no better, and, as proofs of the existence of God, both the second and the third have to be eked out by a silent combination with the first."¹ Indeed, all that Kant will allow to the classical arguments is that they suggest the open possibility that from God, conceived after the fashion of the Neo-Platonic One, the world is derived. If this possibility is to be converted into a certainty, we must find ground for our belief in practical, not theoretical, considerations. It is at this point that Kant's moral argument comes in; our moral consciousness postulates the existence of God as a power adequate to bringing the Supreme Good into being. The truth which the "pure reason" could not establish is convincingly affirmed by the "practical reason." And it is on the moral argument, in its Kantian form or otherwise stated, that post-Kantian

¹ *ERE*. xii. 277-278; see, for a further exposition, pp. 246-248 of the present work; for Kant's appreciation of the teleological judgment, see pp. 153-159.

speculative theology or religious philosophy has principally grounded itself—that is, after the weight of the Kantian strictures upon the older speculation were duly appreciated. An admirable exposition of the moral argument is contained in W. R. Sorley's Gifford Lectures on *Moral Values and the Idea of God* (1918).

It is not that theistic philosophy has bowed itself meekly before the Kantian assault. It is enough to recall that Hegel sought to rehabilitate the ontological argument, that Lotze maintained the cosmological argument, and that the physico-theological or teleological argument (which was reduced by Kant to the argument from design) is being more profoundly viewed in our time in the light of recent science and philosophy.

Nor should it be forgotten that the religious conviction remains, that as man is known of God, so also he knows God, if only in part. "It is inconceivable," says W. P. Paterson, "that Isaiah or Paul, even if they could have studied the *Critique of Pure Reason*, would have admitted that they had been mistaken in supposing that their faculties could reach so far as the Divine Being, and could know His purposes of judgment and mercy."¹

The second influence which has tended to throw the Paleyan natural theology into discredit is the establishment by Charles Darwin of the hypothesis of biological evolution; namely, that the various species have originated through a continuous or gradual process of change from simple to more complex forms of life. Yet the argument from design is not in principle affected by this theory. It may not be a logically valid argument, as proceeding in the nature of the case from effect to cause, from consequent to ground, and not *vice versa*, and as thus

¹ *The Nature of Religion*, 1925, p. 163.

containing more in the conclusion than is to be found in the premisses ; but the point here is that, despite its formal or logical defects and its theological and ethical limitations (these last we shall have to consider later), it has not been discredited merely by the general acceptance of the essential Darwinian position. At first sight the biological theory of descent seems so strikingly to vindicate the mechanical view of nature as to banish the idea of purpose altogether, not only from scientific explanation, but also from philosophical or metaphysical interpretation. There appears to be no more design, for example, in the Darwinian principle of natural selection than “ in the course which the wind blows.”¹ But a consideration such as this does not necessarily imply that we can no longer make the transcendent inference from the works of nature to God ; it only implies that in the light of the principles of biological evolution we must revise our conceptions of the manner of God’s working in nature. Clement Webb has put this point felicitously : “ The Argument from Design does not stand or fall with Paley’s way of stating it, or with his illustrations. For the impression of design made upon us by the spectacle of the world is prior to the elaboration of an argument based upon that impression, nor does it disappear with the perception of gaps in such an argument.” And he adds : “ There are simpler forms of argument, resting on the same foundation, which do not lose all their force with that discovery of the principle of the preservation of useful variations in organic beings through natural selection which has led us to explain in a different way the origin of ‘ adaptations ’ which seemed to Paley and his contemporaries to be directly due to the designing skill of a divine artist. Such are the Psalmist’s ‘ He that made the eye, shall he

¹ *The Life and Letters of Charles Darwin*², 1887, i. 309.

not see ? ' or the more exact reasoning of Plato in the *Philebus*, where the origin of the elements of man's material frame from the great mass of like elements in the universe suggests by analogy that the mind of man must also have its source in 'a royal soul and mind in the nature of Zeus.' " ¹

If as a result of the Kantian criticism we may no longer cultivate our natural theology with the confidence of the older philosophical theism, it by no means follows that we must not cultivate it at all. The knowledge of God given through reflection upon nature may not be demonstrable knowledge in the strictest metaphysical sense, nor—as I believe—until combined with the knowledge of God derived from the ethico-religious consciousness, does it yield anything like the full theistic conception. But that is no argument against following the natural or rational principle as far as it will take us. It is surely an impoverishment of Christian theology if it may not embody in its witness for God the traces of the divine Father's presence in the natural world that are discerned by many a reflective spirit, and that cannot but enter into the Christian consciousness.

If, again, as a result of the labours of Darwin we can no longer cultivate our natural theology after the manner of Paley and the Bridgewater Treatises, it by no means follows that we must not cultivate it at all. It is one thing to repudiate in the name of science the doctrine of special provisions and adaptations, and, in general, all theologising in science, but quite another thing to be willing to ignore or discount in the name of science the vast impression of immanent reason and purpose which the totality of the system of nature, animate and inanimate, makes upon the mind and spirit.

W. R. Sorley has expressed a distinction which

¹ *Problems in the Relations of God and Man*, 1911, p. 160 f.

may serve to throw light upon the theological position I have been seeking to suggest; namely, that while the principle of natural theology should be pushed as far as it will go in the interpretation of nature, it cannot give us a full theistic conclusion. It is the distinction between "the theism of the religious consciousness for which God is in some manner an immediate object; and the theism of philosophical theory in which the idea of God is arrived at by a process of reflective thought and functions as an explanation of reality." "The two ways," he says, "cannot permanently diverge and yet each be valid along its own lines: for the religious consciousness is just one aspect of the human consciousness." ¹

A similar consideration was in Lord Balfour's mind when he said: "The highest conceptions of God seem to approximate to one of two types, which, without prejudice, and merely for convenience, I may respectively call the religious and the metaphysical. The metaphysical conception emphasises His all-inclusive unity. The religious type emphasises His ethical personality. The metaphysical type tends to regard Him as the logical glue which holds multiplicity together and makes it intelligible. The religious type willingly turns away from such speculations about the Absolute, to love and worship a Spirit among spirits." ²

It should be our object, then, as we study the problems of natural theology, to effect a harmony, if possible, between the two ways or types of theism. It may be only a cold, abstract, and limited theism at the best that we reach through applying the rational principle to the world of nature—whether

¹ *Op. cit.*, p. 304.

² *Theism and Humanism*, 1915, pp. 19, 20; cf. also *Theism and Thought*, 1923, pp. 256-258.

narrowly or broadly conceived as exclusive or inclusive of man—even when the application is aided here and there by a venture of rational or philosophic faith ; but it is, indubitably, great gain—in view of the prevalence of the naturalistic and agnostic outlooks—if we reach anything like a theistic conclusion corresponding to, if lacking the warmth and richness of, the theism which is immediately given in moral and religious experience.

I have but indicated the place which I think natural theology should hold in modern theistic thought, and I cannot here attempt to do more. But I may add that my statement of the place which natural theology should hold in modern theistic thought would be challenged even from within theological circles—on the one hand by the intellectualist exponents of theistic idealism, and on the other by the agnostic Neo-Kantians attaching to the Ritschlian movement.

For the rest, it should be kept in view that the rational way of approach to the theistic interpretation of nature is of necessity a narrow way. This should further reconcile us to the idea of the limitations of natural theology ; and it should perhaps suggest to us that in our theistic interpretation of nature we should not forget the essential message of mystical theology, with its reliance upon a broader method, upon a more immediate base.

According to mystical theology—I do not use the phrase in too technical a sense—there are two ways in which we may attempt to discern the eternal in the temporal, to realise the presence of God in our changing world. On the one hand, we may seek God with the inward spiritual eye. Look within, is the counsel of the masters of the inner life. Accustom thyself to the holy service of the inward temple. Accustom thyself to dig deep for the pearl of eternity

in thine own soul. Better the fountain in the heart than the fountain by the way. And when thou hast learned to look within, learn also to be still—to be still and know. “If thou wantest,” said Richard of St. Victor, “to search out the deep things of God, search out the depths of thine own spirit.”

But we may also seek God with the outward eye of sense. There is a natural mysticism as well as a spiritual mysticism; and it is with natural mysticism we are here concerned. That it may go hand in hand with the religious rationalism which sees in reason “the candle of the Lord,” the lives and thoughts of the Cambridge Platonists well show. In the interpretation of nature it relies upon something deeper than logic, upon something instinctive and intuitive, upon the *fundus animæ*, the “bottom” or “ground” of the soul. It receives expression in Augustine’s fine phrase, that all things bright and beautiful are “footprints of the uncreated Wisdom.”¹ The same God whose light shines inwardly in the heart manifests Himself in the outer world, and calls our spirits into communion with His. His “dwelling,” as Wordsworth said, “is the light of setting suns, and the round ocean, and the living air, and the blue sky.” Or, as Ruskin said—the words are now carved on his memorial stone at Keswick—“The Spirit of God is around you in the air that you breathe, His glory in the light that you see; and in the fruitfulness of the earth and the joy of its creatures He has written for you day by day His revelation.”

“So schaff’ich am sausenden Webstuhl der Zeit,
Und wirke der Gottheit lebendiges Kleid.”²

If we cannot draw readily from the deep wells of

¹ Cf. *De lib. arb.*, II. xvi., xvii.

² “Thus I weave at the whirring loom of time, and work the living garment of the divine.”

the soul, then perhaps we can surrender ourselves to nature's hidden life, and respond to the mystic harmonies that beat upon sense and sight, so attaining unto such a real consciousness of the mystic Presence as shall make this earth seem none other than the dwelling-place of God and the luminous forecourt of heaven.

Wherefore, as we pursue the high road of natural theology, we should do well to remind ourselves that there may be other ways than the logical or rational leading to the spiritual appreciation of nature. Should we not even do well to turn aside from the high road now and then to seek refreshment of soul at the inexhaustible fountainheads of spiritual or mystical religion ?

NOTE

RAYMOND OF SEBONDE

RAYMOND'S *Liber Naturæ* owes no small part of its fame to its association with Michel de Montaigne. In his essay, "Apologie de Raimond Sebonde," by far the largest of his essays, Montaigne tells how Pierre Bunel, a scholar of high esteem, left a copy of Raymond's work at Montaigne as a gift to his father, commending it to him as a book for the times. "It was even at what time," explains the essayist (I quote from John Florio's gusty version), "the new fangles of Luther began to creepe in favour and in many places to shake the foundations of our ancient beleefe." It may be that "the new fangles of Luther" did not trouble the mind of the elder Montaigne; in any case he neglected to study the book which his grateful guest had presented to him, and which, like many another gift book before and since, lay long in its place forgotten. However, a few days before his death the elder Montaigne chanced to light upon it, and finding difficulty with the language in which it was written (a kind of Latinised Spanish, as Bunel is reported to have said, but better described as a kind of Hispanised Latin), bade his son translate it into French. This Michel did, in dutiful obedi-

ence, and he found it easy to translate such an author, where nothing but the matter is to be represented, and no particular grace and elegance of style. His father took singular delight in the translation, and ordered it to be printed, which was done after his death in 1569. Says Michel: "I found the conceits of the author to be excellent, the contexture of his work well followed, and his project full of pietie. His drift is bold, and his scope adventurous; for he undertaketh by human and naturall reasons, to establish and verify all the articles of Christian religion against Atheists. Wherein (to say truth) I find him so resolute and so happy, as I deeme it a thing impossible to doe better in that argument, and thinke that none equalleth him." Indeed, so much struck was Montaigne with the quality of the book that it became a wonderment to him how it could possibly have been produced by an author whose name was so little known. Accordingly, he demanded once of Adrianus Turnebus ("so called by the gods," says Hallam,¹ "but by men Tournebœuf, and, as some have said, of a Scots family, who must have been denominated Turnbull") "what such a booke might be, who answered, that he deemed the same to be some Quintessence extracted from out Saint Thomas Aquinas: For, in good truth, only such a spirit fraught with so infinite erudition, and so full of admirable subtiltie, was capable of such and so rare imaginations." But while Michel says that Turnebus knew all things, he does not appear to yield entirely to the great scholar's opinion as to the source of the book (which was indeed beside the mark), for he concludes his introductory words with the reflection that "whosoever be the author or deviser of it (the title whereof ought not without further reason to be taken from Seboud) he was a very sufficient-worthie man, and endowed with sundry other excellent qualities."

Raymond was a Spaniard by birth, and is said to have been born at Barcelona in the latter part of the fourteenth century. He taught medicine at Toulouse, says Montaigne, and it appears that he also taught philosophy there and, later, theology. He died at Toulouse, it is said, in 1437. The book to which he owes his fame appears to have been written between 1434 and 1436. The literary style of the work is plain and simple, and sufficiently pedestrian, and one

¹ *Literature of Europe, 1837-39, ii. 7 f.*

readily appreciates Montaigne's remark that in the rendering of such an author only the matter needs to be considered. The copy in the University of Glasgow, which I have been permitted to use, belongs to the Frankfort edition of 1635, and the title runs, *Theologia Naturalis sive Liber Creaturarum, specialiter De Homine, et de Natura eius, in quantum homo, et de his, quæ sunt ei necessaria ad cognoscendum Deum et seipsum et omne debitum, ad quod homo tenetur et obligitur, tam Deo, quam proximo*, the author Raymundus de Sabunde (this place-name is variously spelled) being described as *Artium ac Medicinæ Doctor et Systematicæ Theologiæ quondam Professor*.

While the title, *Theologia Naturalis sive Liber Creaturarum*, is of early authority, apparently it was not the original title, which was simply *Liber Creaturarum* or *Liber Naturæ sive Creaturarum*. This is interesting in view of the consideration that the book must have owed much of its vogue to the novelty of this phrase, which soon found its way into the title-page, *Theologia Naturalis*.

In the essay afore-mentioned Montaigne speaks of the objections preferred in his own time against Raymond's *Theologia Naturalis*. The first was that it is wrong to ground one's belief upon "human reasons." It is an objection that goes so far to justify the ascription to Raymond of his traditional title. That there is force in the objection, Montaigne is well aware; if, as he says, we could attain to this verity wherewith it hath pleased the goodness of God to enlighten us, by "meanes meereely humane," then why have "so many rare and excellent mindes, and so plentifully stored with naturall faculties, as have beene in times past," missed the attaining of this knowledge? "It is faith onely," he adds in characteristic vein, "which lively and assuredly embraceth the high mysteries of our Religion." The second objection to the book was that its arguments were weak, and from a modern theological standpoint we should often be inclined to agree with the objector. But Montaigne sees in this objection the frenzy and overweening pride of atheism. And he would suppress this frenzy by crushing and trampling it under foot, to make the atheist feel "the emptinesse, vacuitie, and no worth of man"; and by violently pulling out of his hands "the silly weapons" of his reason, to make him "stoope, and bite and snarle at the ground." From which we may gather that the translator

and essayist has not caught the spirit of his author, although he does testify to one instance at least of conversion by the method of reason. "I know a man of authority," he says, "brought up in letters, who confessed unto me, that he was reclaimed from out the errours of mis-beleeving by the Arguments of Sebond."

Having launched out into his tirade against atheism, Montaigne is led on from theme to theme, discoursing quaintly, learnedly, and egotistically by the way, and forgetting the Sebond altogether; with the result that for every page of the Apology proper there are twenty pages in which Raymond's very existence is ignored. "He sometimes," says Hallam, "makes a show of coming back from his excursions; but he has generally exhausted himself before he does so."¹

The Prologue to the *Book of the Creatures* is perhaps the most interesting part of it, not merely because it was placed on the Index—in 1595—but because it contains a glorification, in the spirit of that earlier Raymond, the redoubtable Raymundus Lullus, of the power of reason and of the natural knowledge of God, and because it contains, too, some of Raymond's most characteristic teaching. It is usually said that the Prologue was condemned as exalting the Bible—as the Protestants were doing—above the Church, but it is much more likely that it was condemned for its exaltation of the natural knowledge of God, in this being against the spirit of the Thomist tradition.²

Raymond distinguishes in the Prologue between two sources of theological knowledge—the book of nature or of the creatures, and the Bible—the former being the universal and immediate source of man's knowledge of God, while the latter—the Bible—is intended partly to make us understand the book of nature better, and partly to furnish us with new truths which we cannot learn from nature as such, but which, being once revealed to us, may be made intelligible by the aid of reason. It was in view of such a position that I have suggested³ that Raymond originated a movement

¹ *Op. cit.*, ii. 171.

² Cf. C. C. J. Webb, *Studies in the History of Natural Theology*, p. 296; Zöckler, *Geschichte der Apologie des Christentums*, 1907, p. 227; Hauck, *R.E.*³, p. 415.

³ See p. 38.

within Christendom which issued in the high Trinitarian speculation of Hegel.

It is a book which does not lend itself to analysis, even although the author some half a dozen times in the course of it indulges in a retrospective *titulus* or chapter (an *epilogatio prædictorum*). But the first part of the book describes the ascent of nature (*scala naturæ*), a conception which goes back to Aristotle, through the four stages of mere being, mere life, sensitive life, and intelligent or self-conscious life. At the summit of the ascent is man, who is the epitome of the whole creation—the microcosm, in the term of which Calvin and Lotze have made so much use—but whose highest dignity consists in his being fashioned in the image of God. For nature points us beyond and above itself to an Author who has called it out of nothing, and who must possess all the properties of the things created by Him in the most perfect measure. To this transition demanded by reason to a supramundane Creator, Raymond attaches the various so-called “proofs” for the existence of God, which continued to be the cardinal points of natural theology. It should be observed in this connection that in Raymond’s work the moral argument first appears in a form that may be said to anticipate Kant. It should also be observed that Raymond, in this as in other matters following Anselm, lays the greatest stress upon the ontological argument—a further evidence, if further evidence were needed, that Turnebus guessed badly in ascribing the *Liber Naturæ* to Thomas Aquinas.

The impression one gains of Raymond is that of a mind at once devoted to the pursuit of science and sensitive to the deeper feeling of religion, a mind which delighted both in the contemplation of the ladder of nature and in that mystical love and contemplation which may be directed to nature’s Author. “It is man’s duty,” he says, “and the whole of his religion to love God who first loved us and to rise into living union with God, and having risen into the love of God, to descend again in love unto all God’s creatures.”

In the second part of the work Raymond proceeds to show the inner harmony of the highest truths of natural religion with Christian doctrine, and how that Christian doctrine is the right fulfilment of natural religion. He treats of the Person of Christ, the Church, and the Bible. The Bible and the Book of the Creatures are in entire agreement,

differing only in manner of speech, the Bible instructing us directly and the Book of the Creatures indirectly by the aid of reason. In this part Raymond passes beyond natural theology in the ordinary sense of the term into the sphere of revealed or historical theology.

There is an analysis of the *Liber Naturæ* in Zöckler's work, already cited ; there are also translations of some of its characteristic passages in Webb's work, also already cited. The last-named emphasises the mystical quality of Raymond's mind, and even finds in him anticipations of the modern pragmatist attitude to truth.

No doubt Raymond pushes the rational method too far in his effort to demonstrate, or at least confirm, from nature the whole content of the system of Christian Doctrine ; yet we cannot withhold our admiration from a writer whose scope—in Montaigne's language—is so adventurous and whose project so full of piety. No doubt also his work is often vague, indefinite, and discursive, as one might expect of a first effort in a fresh direction ; yet it is an outstanding work, and had no rival in its own department for more than three hundred years. That he was an earnest and gentle soul we cannot doubt, one who loved God with all his heart, and his fellow-men, and the whole created universe ; and in these days when the anti-mystical and anti-rational movement in theology appears to have spent its force, and we are seeking to lay the foundations of natural theology anew, in the light of the new knowledge of our time, and with a new appreciation of the intimacy between the mystical and the rational, it is worth while to have recalled the memory of one who knew what it was to be united with God in the mystical bond of love, and who sought, according to his lights, by human and natural reasons to verify the articles of his Christian faith.

CHAPTER V

NATURAL SCIENCE :

1. ITS METHOD AND FUNCTION

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AT the outset of our discussion I said that there are two broadly distinguishable attitudes towards the world that may be regarded as underlying or bound up with the phrase, "Nature and God." First there is the attitude of natural theology, which looks upon the world as God, or as revelational of Mind, Spirit, Will, Purpose. Then there is the attitude of natural science, which looks upon the world as Nature, or as revelational of natural—as distinguished, for want of a better term, from supernatural—laws, principles, and processes. We have examined the place of natural theology in theistic thought, and I have suggested that while natural theology is still worthy of cultivation, we can hardly cultivate it nowadays after the manner of Paley, in so far as it was theologising in science, nor with the confidence in man's natural capacity of knowing God exhibited by rationalism. It is of the essence of rationalism, by which is here meant rationalistic theism, that the existence of God can be proved or demonstrated, as one demonstrates a proposition of Euclid ; whereas in post-Kantian theism, the existence of God is usually regarded as impossible of logical demonstration, being a primary intuition or a postulate of experience. Thus W. L. Davidson, for example, whose theistic faith is beyond suspicion, looks upon the existence of God as founded, not upon a deductive process, nor even upon a merely inductive process,

but upon our need of Him, which He Himself both originates and satisfies. Accordingly, the classical theistic "proofs," "these venerable friends," are viewed not as proofs, but as "helps towards the steadying of our thoughts on God and as giving a concreteness to Him which shall inspire our faith and direct our conduct."¹

And now to take a nearer view of the distinction between natural theology and natural science—a distinction which may be said to have clearly emerged only with our modern world, and of which Bacon's appeal to efficient causes as against final causes may be regarded as prophetic. Natural theology, I have said, looks upon the world as God, and natural science looks upon it as Nature. Natural theology, let me go on to say, interprets the world as God, that is, as a product or manifestation of Mind, Spirit, Will, Purpose; whereas natural science explains or describes the world as Nature, that is, as a system of natural or rational laws, principles, and processes. Interpretation and explanation or description, by these terms the distinctive functions of natural theology and natural science may respectively be characterised.

Interpretation, explanation, and description are words much used among us with reference to natural phenomena and processes, and I shall suggest in a later chapter how they might have a certain fixity of use. Meantime, it may be noticed that I suggest interpretation as the term which may properly denote the function of natural theology, while explanation and description appear to be suggested indifferently as terms properly denoting the function of natural science. But it should be observed that both an "explanatory" and a "descriptive" view of the function of physical science, at least, are more or

¹ *Recent Theistic Discussion*, 1921, p. 26 ff.

less recognised. In the "explanatory" theory the aim of physical science is represented as getting behind appearance to the reality of which the physical world is a manifestation. But the reality of scientific realism is not the reality of naïve realism. "To those men of Science of to-day," says E. W. Hobson, "who believe that Science leads the way to reality, the real world consists of such things as electrons, atomic nuclei, vibrations of atoms and molecules, radiation, and space-time." He adds: "What the real world of such men of Science will be like a century hence it would be extremely interesting to know."¹ In the "descriptive" theory the aim of physical science is to classify phenomena and their sequences, and to bring them under general laws and theories; but the question of the reality, in any ultimate sense, of the sensuous objects or physical processes under observation is considered to be irrelevant to physical science. A so-called law of nature does not necessarily correspond to a set of relations between real entities. For example, it is unnecessary, on this theory, to ascribe to "the quadruply ordered manifold which is fundamental in Einstein's theory of relativity . . . any other kind of reality than that which appertains to every permanent concept as such."²

Personally, if I may venture an opinion, my sympathies lie with the "descriptive" theory of physical science, but that need not prevent me using the terms "description" and "explanation," meantime, as virtually equivalent in the wider context of natural science.

Now it will throw light upon the function of natural science in general to notice, in the first place, that in seeking to describe or explain the world natural science employs an abstract method.

¹ *The Ideal Aim of Physical Science*, 1925, p. 11.

² *Ibid.*, p. 19.

A quotation at the outset from that suggestive scientific writer, J. Arthur Thomson, will serve to prepare our minds for the appreciation of this point. After remarking that the scientific view of nature is composed of many partial views contributed by the various sciences, he goes on to say: "The chemist's account of a peacock's tail is an abstraction, and so is the physicist's, the biologist's, and the psychologist's. But even when all these results, reached by scientific abstraction, are pooled, we have not 'an account of the whole matter'—of 'the positive full-orbed reality.' That correlation often has to wait for genius. Moreover, the scientific synthesis, if it be achieved, requires to be assimilated with what the artist, the poet, and the genuine lover of birds may be able to tell us concerning the peacock's tail."¹

An exposition of this statement would bring out the fact that not only has each science its own particular standpoint in accordance with which it makes its abstractions, but that the sciences increase in abstractness as qualitative differences are ignored and the phenomena more and more described or explained in terms of quantity. At the same time "the quantitative sciences, being the most abstract, become less and less adequate the more *concrete*, that is, the more complex, the unity of the differences of an object."²

And now let us take a more intimate view of our subject. Consider, for example, the definition of nature itself, which A. N. Whitehead offers us in his *Concept of Nature* (1920). Nature is "that which we observe in perception through the senses."³ In other words, nature, from the standpoint of natural

¹ *The System of Animate Nature*, 1920, i. 18, 19.

² Sir Henry Jones, *A Faith that Enquires*, 1922, p. 32; cf. further, p. 194 f. of the present work.

³ P. 3; cf. c. i. *passim*.

science, is neither more nor less than the object of sense-perception. On the one hand, it is no *less* than the object of sense-perception. That is to say, it is an object in the full meaning of the term. It is not something merely transsubjective, as it is in certain forms of idealist or spiritual philosophy. It is something which actually presents itself to the senses. It is a real entity for natural science, independent of mind or thought. It is "self-contained as against thought." It is in this sense a "closed system"; and it may be studied without reference to mind, that is, apart from the fact that it is observed or thought about. Here the abstract character of the scientific view of nature is very evident. But "this closure of nature," as Whitehead is careful to add, "does not carry with it any metaphysical doctrine of the disjunction of nature and mind." By which is meant, as I take it, that the "closure" being an abstraction made for the purposes of natural science, settles nothing in the philosophical or metaphysical sphere.

Or, as E. W. Hobson has it in his *Domain of Natural Science* (1923): "For Natural Science the rôle of the subject in perception may, provisionally or methodologically, be regarded as purely passive, that of experiencing physical perceptions."¹ This is to look at the matter from the side of the subject, but in another passage Hobson looks at it also, as we have seen Whitehead does, from the side of the object: "It is sufficient . . . for the purposes of Natural Science to regard a perceptual object as a construct of sense-impressions, whatever else it may for the purpose of systematic Philosophy be regarded as being or implying."²

Nature is, then, so far as natural science is concerned, no *less* than the object of sense-perception.

¹ P. 53.

² *Ibid.*, p. 54.

On the other hand, again as viewed by natural science, it is no *more* than the object of sense-perception. In this also the abstractness of scientific method appears. The scientist may also be poet or artist, or a man of philosophic or religious mind, or even all of these together, but *qua* scientist he has no interest or concern in moral and spiritual values. What Alfred Noyes has written in the *Torch-Bearers* may be true to the experience of many individual scientists, but is hardly in keeping with the strict interpretation of natural science which is now before us :

“ What is all science then
But pure religion, seeking everywhere
The true commandments, and through many forms
The eternal power that binds all worlds in one ?
It is man’s agelong struggle to draw near
His Maker, learn His thoughts, discern His law,—
A boundless task, in whose infinitude,
As in the unfolding light and law of love,
Abides our hope, and our eternal joy.”

They are attractive enough lines, but, if judged as prose, they would virtually identify natural science with natural theology. To affirm that science seeks for the eternal unifying power of all the worlds, and strives to learn God’s thoughts and to discern His law, is—as Arthur Thomson would say—to speak “two languages in one sentence.” The function of natural science is a more limited one, as we have seen, and in fulfilling its function it conceives of nature abstractly, considering only sense-perceptions, and shutting from its view the values of life and experience. It may be that Whitehead defines the concept of nature from his own theoretical standpoint of physicist ; and physics is not the whole of natural science. Yet even so the general position appears to hold good, and we may say that the biologist no more than the physicist,

and even the psychologist no more than the biologist, takes cognizance of things with which the term "nature" ordinarily "echoes" for us—"of the beauty which thrills us, of the power which strikes us with fear, of the order . . . which fills us with intellectual satisfaction, of the religious sentiment of awe which may be evoked when beauty and power and order are joined with mystery and immensity."¹

It may savour of unreality to use such a phrase as "scientist *qua* scientist." To reflect upon experience is a universal impulse or propensity, and no man of science, however passionate his concentration upon the things and events of nature, can avoid turning his eyes from the narrow way, to right or left. Yet it is convenient to discriminate between a man's utterances as scientist and his utterances as conscious or unconscious philosopher. As a scientist Whitehead excludes from his thought about nature any reference to moral or æsthetic values, "whose apprehension is vivid in proportion to self-conscious activity";² but as a metaphysician he says that "the values of nature are perhaps the key to the metaphysical synthesis of existence."³

It might be well to observe at this point, in view of current misunderstandings, that the distinction between the empirical or scientific and the speculative or metaphysical interest in nature is one upon which Bishop Berkeley laid stress; and further, that he sought to vindicate the relation of natural science, abstract as is its outlook upon nature, to the real world of perception. "Berkeley's idealism," says R. F. A. Hoernlé, "is hardly less a philosophy of science than it is a philosophical defence of speculative theology." "Indeed," he adds, "the value and

¹ R. F. A. Hoernlé, *Matter, Life, Mind, and God*, 1923, p. 27; cf. also the same writer's *Idealism*, 1924, p. 136.

² *Op. cit.*, p. 5.

³ *Op. cit.*, p. 5.

originality of Berkeley's theory of Nature are being revealed to us in a fresh light at the present day by such work on the foundations of natural science as A. N. Whitehead's analysis of Nature as 'what we perceive by the senses.'"¹

So far, then, the abstract character of the method of natural science as illustrated in relation to the general concept of nature. Consider it now in relation to the elements, laws, and principles belonging to the scientific view of nature. Science not only reduces the experienced world to the object of sense-perception; it also proceeds, in the interests of scientific order and unity, to correlate what is perceived by the senses with the imperceptible entities and processes of scientific hypothesis.

In E. W. Hobson's Gifford Lectures, already cited, there is a very striking exposition in this connection of the truth that natural science proceeds by way of selection, elimination, abstraction. That writer adheres to the "descriptive view" of natural science on which I have already touched, and seeks to give it precise and explicit statement. Scientific knowledge he regards as of the nature of empirical description, like common or public knowledge. But in science empirical description is more exact and more systematic, the analysing and generalising powers of the mind receiving there greater scope. A primary effort of science, he continues, is to construct rules governing certain sequences of physical events. In carrying out this aim and effort science forms abstractions, which symbolise or represent only certain aspects of the physical percepts under review. Eventually after further observation and experiment many various sequences of physical events are comprehended under some general or universal law.

Thus the common or public knowledge that solid

¹ *Idealism*, pp. 58, 59.

bodies tend to fall to the ground passed into scientific knowledge as the result of the careful observations, experiments, and calculations of Galileo, and was formulated as the law of falling bodies; which law was extended in its turn through Newton's brilliant generalisation (founded also on the discoveries of Kepler) into the universal law of gravitation. But from the mathematical formulas which express these laws, it is clear that abstraction is made from the physical constitution and properties of the bodies under consideration and of the medium in which they exist, whether in motion or at rest. No account is taken, nor for the purposes of the formulas need be taken, of the size or colour of the bodies, or of the resistance of the medium. Indeed, in the case of the law of falling bodies, mass or weight is also a factor that need not be taken into account. Bodies of different weights, dropped by Galileo simultaneously from the leaning tower of Pisa, reached the ground together. Mass enters into the formula for gravitation, but the abstract character of the Newtonian mechanics is still further evidenced in this, that the mass of a body is assumed to be concentrated at a single point.¹

It appears, therefore, from what has been said, that a scientific law is not a purely objective thing, resident as it were in the world of physical percepts. It is expressed in abstractions of thought, in concepts of the mind. It is in fact a conceptual thing. Yet though conceptual, it is not on the other hand purely subjective. Natural science recognises for its purposes "the essential element of fact" in the physical world, and by the facts of the physical world all scientific laws and principles,

¹ Professor J. Laird reminds me that this was no *mere* assumption on Newton's part, and how careful the scientist is as to the legitimacy of this or the other "abstraction."

all so-called laws of nature, are conditioned and governed.

But further, there are two types of conceptual theory. In the first type, of which we have been speaking, the scientific concept has a direct perceptual counterpart in nature, but in the second type it has no direct perceptual counterpart, or it may not be assumed to have such. Instead of being an abstraction from certain perceptual objects or processes, it cuts itself loose altogether—to all appearance—from the perceptual world. Vitalistic hypotheses in biology provide an instance in point. The postulated life-force (*vis viva*) does not appear to have any relation to the world of sense-perception.

At the same time, as I might remark here, vitalistic hypotheses in biology, especially those of the older sort, serve to illustrate the danger of multiplying vague and indefinite concepts. It takes us no further in the explanation of organismal life to suppose that there is a *vis viva* inherent in the organism and continually operative. As well explain sleep, remarked Molière, as due to a “dormitive virtue”! As well explain the noise of wheels, says the witticism attaching to the name of Dr. Johnson, as due to the “strepituousness of circumrotatory motion”!

But while this is said, as against the older vitalism, there is no intention of minimising the value of the second or higher type of conceptual theory as such, which meets with Hobson’s full approval, in which there are ideal elements present which have no direct correspondents in the perceptual world. Indeed, “it is precisely in the proper selection and definition of such conceptual elements of a theory that the highest powers of the great men of Science, who are necessarily supreme Artists, have been exhibited.”¹

¹ *Op. cit.*, p. 34.

A scientific theory, then, according to Hobson, who catches up the views of Kirchhoff, Mach, and Pearson—views which may be found in germ in Comte and even in Kant—and seeks to carry them out in detail, and in a wider reference, is a descriptive scheme, which employs abstractions of the mind in its representations of the natural world; and even if such abstractions or concepts have, apparently, nothing directly corresponding to them among physical percepts, they are not thereby discredited; they may even prove to be components of a scientific theory of the best and highest type.

Illustrative instances of both types of conceptual theory may be found in modern biological theories of heredity. In fact, Weismann's theory of the continuity of the germ-plasm, as stated by him in 1885, employs concepts both of the first and the second class—that is, concepts corresponding to perceptual objects, and concepts having no such correspondence. Of the first class is the assumption, on evidence based upon observation, that in the chromosomes or idants, which are the separate masses comprising the chromatin contained in the nucleus of the cell, the definite hereditary substance is located. Of the second is the assumption that the ids composing the chromosome or idant each contain in themselves, in some sense, all the generic, specific, and individual characters of a new organism. And when Weismann goes on to elaborate his theory with the aid of determinants and biophors, his concepts become, apparently, still more remote from the field of direct perception. But the biophors may be as indispensable, says Hobson, in this descriptive scheme as atoms or electrons in physico-chemical schemes; and that they may be purely conceptual entities does not necessarily invalidate them.¹

¹ *Op. cit.*, c. xvii.

It will be evident that Hobson has carried out the "descriptive view" with great thoroughness. Many will be disinclined to go the whole way with him. While willing to accept the "descriptive view," they would hesitate to accept it as developed into a purely conceptual scheme. They cling to the notion that the elements of a scientific theory are real entities, or something more than concepts. Weismann would not allow that the biophors were merely conceptual entities, mere hypothetical units, since the phenomena of life must be connected with material units of some kind; and other more recent voices have been expressing uneasiness under the conceptual theory. They regard it as tending to make the scientific effort appear artificial and the validity of scientific concepts dubious.

Whether we are impressed by the conceptual scheme or not, we must admit the abstract character of the method which natural science follows as it fulfils its task of description or explanation. And when we think of it, we must be the more ready to see that religion, or for that matter philosophy, need not be in conflict with natural science. On the widely received "descriptive view," at any rate, science does not lay claim to the function of interpreting nature. The cosmography cannot be raised to a cosmology. The so-called laws of nature cannot take the place of the laws or thoughts of God. Empirical description, however generalised, and religious or philosophical interpretation are two different languages. The form of scientific description may clash with that of theological interpretation, but these cannot be in essence antithetic. It is the burden of Arthur Thomson's recent volume, *Science and Religion* (1925), that "scientific description in terms of Lowest Common Denominators cannot be in any radical antithesis with transcendental

interpretation in terms of the Greatest Common Measure.”¹

It appears from the foregoing that at least a practical delimitation is possible in our time as between the spheres of science and religion. Just as religion has been learning that it must not regard itself as a substitute for science, so science has been realising that it is not necessarily in irreconcilable antagonism with religion. If religion will only cease from its encroachment upon the domain of science, and science allow that its domain is limited, there is good hope for reconciliation between the two—of a time when, as Dean Inge puts it, “the science of a religious man will be scientific, and the religion of a scientific man religious.”² And perhaps nothing has done more to encourage such a hope than the acknowledgment on the part of scientists themselves of the self-imposed limitations of the scientific effort.

¹ P. 204.

² In *Science, Religion, and Reality*, p. 345.

CHAPTER VI

NATURAL SCIENCE : 2. HISTORICAL RELATIONS OF SCIENCE AND RELIGION

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IN the last chapter we noticed that on the prevalent "descriptive view" of the function of natural science a practical delimitation of spheres appears possible as between science and religion. In the next chapter I shall illustrate this point in connection with cosmical theory. But a glance now at the historical relations of science and religion will be useful in anticipation of this. It is a well-worn subject, and I want to touch only upon one or two aspects of it. Those who would study the subject as a whole may be referred to J. W. Draper's *The Conflict between Religion and Science* (1874), and A. D. White's *A History of the Warfare of Science with Theology in Christendom* (1896), both of them standard works that have been, and still are, widely read. More sympathetic with the Christian Church and its theologians are two recent works to which reference may also be made: J. Y. Simpson's *Landmarks in the Struggle between Science and Religion* (1925), in which A. D. White's strictures on the Church Fathers are qualified by a consideration of the attitude to science shown in Lactantius, Basil, and Gregory of Nyssa; and H. Macpherson's *The Church and Science* (1927), which focuses attention on the theologians' struggles with the Copernican theory, the new geology, and Darwinism.

It is curious to notice that among certain primitive peoples, according to a recent investigator in

Melanesia,¹ there is actually a delimitation of territory as between science on the one hand, which belongs to the profane world of practical activities and rational outlook, and religion and magic on the other hand, which belong to the sacred world of creeds and ceremonies. Of course in such a context science is used in an elementary sense, and not in the sense of an investigation of nature with a view to the formulation of general laws and theories. None the less, if we may accept our researcher's testimony, science, *i.e.* rudimentary science, and religious and magical beliefs co-exist in harmony in Melanesia. It should be observed, however, that in primitive culture the boundaries between science and religion must be very fluctuating; and further, that although there may be no formal conflict between the two, the more science extends its domain, the more circumscribed becomes the sphere of religion.

It is at the stage of developed religion that the tendency to antagonism and conflict is more pronounced, especially when pioneers of science find themselves opposing the custodians of a religious tradition, whether oral or written; for the religious tradition is almost certain to incorporate elements of science, and an attack upon the scientific tradition is inevitably construed as an attack upon religion itself.

One reason why the conflict between science and religion in Christendom was not very radical or pronounced in the Early Church, or indeed in mediæval times, was that the scientific elements contained in the philosophical or Platonic-Aristotelian tradition were so long stationary. This point is well brought out in a compact and comprehensive little book by Monsieur F. Sartiaux,² in which there is

¹ B. Malinowski on " Magic, Science, and Religion " in *Science, Religion, and Reality*.

² *Foi et Science au Moyen âge*, 1926.

given, among many other things, a very useful account of the development of science and the scientific spirit in Christendom. In the period of the "Christian Conquest" (5th-11th centuries), when "Alexandrinism" ruled in science as in theology, there was technical advance certainly, but no positive advance, the scientific effort being one merely of compilation. In the "Zenith" period of the Church (11th-13th centuries), despite the spread of education and the contact with the Arabs, the spirit of traditionalism still obsessed men's minds, although towards the end of the period there were signs of real progress in science. Some mathematicians appeared, and there were also developments in mechanics, in physics and chemistry, and in the natural and human sciences. In the period of the "Decline of the Church" (14th-15th centuries) the development continued, the spirit of freedom more and more asserted itself against tradition, and a veritable school of scientific, as distinguished from speculative, philosophy at length arose. But it was not until the sixteenth century that there was a genuinely scientific movement in the various departments of science.

In his account of the historical relations of science and religion H. Macpherson does well to emphasise the successive influence of the new cosmology, the new geology, and the new biology. On the new biology I would only remark here that the chief hindrance to it lay in theological prepossession. In the Book of Genesis a doctrine of special creation is taught, that is, of a primeval separation or fixity of species. But this conflicts with biological science, which tells us of a descent of species by gradual change, laying the stress since Charles Darwin upon the evolutionary factor of natural selection. On the new geology I would also remark that the chief

hindrance to it lay, again, in theological prepossession. In the Book of Genesis the creation is represented as having taken place in six days. But this conflicts with geological science, which speaks of vast periods of time during which the earth was evolved to its present state and condition. The modern exegete, it may be added, does not attempt to harmonise the "days" of Genesis with the "periods" of geology.

On the new cosmology I would dwell for a little, by way of introducing the discussion in the next chapter of the history of cosmical theory; and by the new cosmology is to be understood, in especial, the heliocentric hypothesis.

Why was it, let us ask, that it took so long to discover that the earth revolved about the sun? One reason is furnished by the fact of the Middle Ages, in which social conditions were unfavourable to the general progress of science. Another reason was the authority attaching to the tradition derived from Greek philosophy and science and Christian theology. If, as Greek philosophy taught through Aristotle, the sun, moon, and stars were divine and incorruptible, of a quality quite different from that of the sublunary world, it would not be readily believed that this gross earth is actually akin to the heavenly bodies, and itself a planet. Then there was the retarding influence of the so-called Ptolemaic view, which remained the last word in astronomical science for fourteen centuries, which, on the basis of the assumption that the earth is the fixed centre of the celestial universe and that the heavens revolve about it day by day, explained the apparent irregularity of the planetary motions by an elaborate and ingenious system of cycles and epicycles. But the chief reason for the maintenance of the geocentric hypothesis may be found in a dogmatic

motive of Christian theology.¹ The Biblical cosmogony in the first chapter of Genesis supported the notion that the earth is the centre of the universe ; many other Biblical passages went to reinforce the notion ; and through time there was developed, in alliance with the Ptolemaic system, a Christian theological view of the universe, which became so sacrosanct that to doubt or deny it were blasphemy. " Just as man," wrote Peter of Lombardy, " is made for the sake of God—that is, that he may serve Him—so the universe is made for the sake of man—that is, that it may serve *him* ; therefore is man placed at the middle point of the universe, that he may both serve and be served." ² Probably it was the sacred theory of the universe that more than anything else hindered the discovery of the true rotation of the heavens. Certainly, when the discovery was made, it was in the interests of this theory that it was most bitterly opposed.

It was in the sixteenth century, when, as above stated, the scientific movement in Christendom really began, that the Church awakened to the menace of it. But it was the philosophical interpreters of the movement, and not the actual workers in science, like Copernicus and Tycho Brahe, who were the first objects of the Church's suspicions and censures—" Pomponazzi dies without the consolations of the Church ; Bernardino Telesio arouses the anger of the Church on behalf of its cherished Aristotelianism, and a short time after his death his books are placed on the Index ; Bruno, the exponent of the philo-

¹ One should not forget that the dogmatic motive was even earlier than Christianity. For example, Cleanthes accused Aristarchus (who put forward a heliocentric hypothesis) of impiety, saying that he would remove " the hearth of the universe " (τοῦ κόσμου τὴν ἑστίαν). See Plutarch, *Moralia*, vi. 923 A.

² Quoted by A. D. White, *A History of the Warfare of Science with Theology*, i. 117.

sophical implications of Copernicus, is burnt for his pains; Campanella, after twenty-seven years in prison, is detained for three more in the chambers of the Inquisition,"¹ and so on.

"Thoughts that great hearts once broke for, we
Breathe cheaply in the common air."

It was not long before the scientific workers themselves felt the brunt of the Church's opposition. One might think that the relations between science and religion after the Renaissance and the Reformation would have been strained to the breaking-point in the domain of biological science. The world of organic nature comes nearer than does the inorganic world to the sphere of human life, origins, and destiny in which the Church was more especially interested, and in which it had passed scientific as well as more strictly theological judgments. Descartes' mechanistic physiology was of more significance for the relations of science and religion than Gassendi's atomistic physics. Yet it was not in the domain of biological science but in that of physical science, and more particularly in the department of cosmical theory, that the first strong clash came.

In the nineteenth century, on the other hand, the storm-centre was the theory of biological descent and not the nebular hypothesis. In choosing to oppose Darwin rather than Laplace, the conservatives among the theologians of the nineteenth century judged well, according to their lights. But the conservative theologians of the sixteenth and seventeenth centuries—and the theologians were all conservative then in their attitude towards the Biblical and scientific tradition—became more alarmed by the physical and astronomical theories of the post-Reformation age than by theories on such subjects

¹ C. Singer in *Science, Religion, and Reality*, p. 126.

as the relation of body and mind that were actually subversive of the traditional dogmatic anthropology. Accordingly, they waged their fiercest warfare in the sphere of cosmological science. There is this to be said for them, that the physical and astronomical theories aforesaid constituted a challenge to that sacred theory of the universe which, as already noticed, had been built up on the basis of Greek philosophy and science, it is true, but in particular on the basis of the great opening chapter of the Bible, the first of Genesis. Perhaps on that account it would have been difficult to ignore the challenge. Then, as it is now in some quarters, an attack on the Mosaic cosmogony was regarded as an attack upon the whole Christian theological system. And so the dramatic story of the trial, condemnation, and abjuration of Galileo sets the stage for the long struggle which has lasted till our time and of which the end is not yet.

But, as indicated in our discussion of the function of natural science, the trend of modern philosophy of science is towards a practical delimitation of frontiers as between science and religion. The man of science may or may not have a personal contribution to make towards religion, but he does not feel himself constrained to deny the reality and truth of religion, whether explicitly or implicitly, as when a Büchner, aggressively confident in his materialistic and mechanistic philosophy, dismissed every form of supernaturalism or idealism from "the hermeneutics of natural facts." It is often something less than "interpretation" of natural facts, as we have seen, that is now claimed by its leading representatives as the function of natural science; and thus the door is not closed, so far as natural science is concerned, upon a spiritual interpretation of nature, much less upon the reality and truth of religious experience.

CHAPTER VII

SCIENCE AND RELIGION :

A PRACTICAL DELIMITATION OF SPHERES
(COSMICAL THEORY)

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SCIENCE AND RELIGION :

A PRACTICAL DELIMITATION OF SPHERES (COSMICAL THEORY)

I SHOULD now like to illustrate in some detail, in relation to one great agelong problem, namely, the problem of the cosmogony, how a practical delimitation between the spheres of science and religion appears possible in our time. It was in connection with cosmical theory, as already indicated, that the conflict between the Church and science became embittered ; and it will be instructive to notice how in the selfsame connection the issues have been clearing for our modern age, and a more hopeful relationship between science and religion is being established.

“ From the nature of the human intellect,” said Comte in the Introduction to *Positive Philosophy*, “ each branch of knowledge, in its development, is necessarily obliged to pass through three different theoretical states : the theological or fictitious state ; the metaphysical or abstract state ; the scientific or positive state.” Such is the famous law of the three states or stages, and I think we may allow that cosmical theory, which I use now in the narrow sense of theory of the world’s origin, provides a broad and striking instance of it. The problem of the origin of the cosmos or ordered universe has exercised the human mind since early times. It is a problem which, broadly speaking, theology, philosophy, and science have, in our Western world at least, successively tried to solve. The solution of it rests now

for the most part with science, yet both theology and philosophy retain in it still a vital interest. So that if the law of the three states is, as Comte taught, an actuality, there is also another law to be suggested, namely, the law of the circuit of the three states, whereby both theology and philosophy come at length to their own.

Let me first support the statement that, in our Western world at least, theology, philosophy, and science have in succession tried to solve the problem of the cosmogony.

The ancient cosmogonies are predominantly theological, and, therefore, mythological, in character. A good instance of theological cosmogony is provided by the so-called Cosmogonic Epic of the Babylonian mythology, discovered in recent times in the library of Ashurbanipal at Nineveh. The copy, in cuneiform tablets, that has come to light was made in the seventh century B.C., but the actual date of the poem, even in its present form, is said to be earlier than 2000 B.C. Here the primeval watery chaos, a common feature of the Babylonian cosmogonies (to be found also in some of the Hindu and Egyptian legends), is represented as being composed of Apsu and Tiamat, which are interpreted as male and female personifications respectively—on the one hand of the fresh life-giving water which descends from heaven in the rain, and on the other of the sluggish salt water of the ocean. In the beginning these were mingled, and from them the gods were formed, who in their turn fashioned the world. Thus the cosmogony is in the first instance a theogony. When the gods resolved to make the world, and so to bring order out of confusion, they were opposed by the representatives of chaos. Accordingly, the work of creation became a mighty conflict between the gods and the primeval powers and ele-

ments, and more especially, as in the later versions of the myth, between Marduk, the god of light, and Tiāmat, the great dragon of the waters. When Marduk had slain Tiāmat, he devised, as is recorded, a cunning plan. He clove Tiāmat in two, and from one-half of her he made the firmament, which he established as a covering for the heaven; with the other half he made the earth. Afterwards he created the heavenly bodies, and caused the sun to shine by day and the moon by night. Then he created the plants and animals and, lastly, man.

Here, in this ancient myth, it is said, is the indubitable source of the Biblical cosmogony in the first chapter of Genesis. The material resemblances between the two stories are indeed very striking, and they are more numerous than my brief outline of the Babylonian story shows. In both there is the same mass of waters at the beginning, enveloping the void and formless earth (and it is denoted by almost the same word, Tiāmat, the feminine form corresponding to the Hebrew Tēhōm, the "deep"); in both the chaos is divided into an upper and a lower ocean, the firmament supporting the first, the earth resting upon the second; in both the heavenly bodies are formed after the earth (which modern astronomy could not allow), and appointed to regulate time; and in both the creation of animals and of man is recorded.

It is unnecessary, however, to suppose that the Biblical writer had a copy of this particular version of the Babylonian poem before him when, in the sixth or fifth century B.C., he shaped his narrative. Perhaps an older poem was the common source both of the Babylonian poem and the story in Genesis. All that need be affirmed is that the Babylonian cosmogonic myth must have undergone a long period of naturalisation in Israel, in the course of which it

was purified of its grosser elements and spiritualised, before it was set down in the sober and sublime form with which we are so familiar.

Pass now from the theological to the philosophical cosmogony. I shall not deal with the deep speculations of the Indian philosophies upon the origin and constitution of the universe, but shall refer only to ancient Greek speculations on this subject, selecting the Platonic cosmogony in the *Timæus* as a good type of philosophical cosmogony, as a cosmogony also of great historical significance, seeing that until Aristotle's metaphysical and physical writings became known in the thirteenth century, the *Timæus* provided Western Europe with its "general standing scheme of the natural world."¹ It ought to be remarked, however, that Plato himself would very likely have disallowed the word "philosophical" as applied to the cosmogony of the *Timæus*, because very likely he did not intend that the mythical element in the Dialogue should be understood literally. On the other hand, it would probably have been impossible, even for Plato himself, to draw the line between the mythical and the philosophical in his cosmogonic scheme. On this question of interpretation we need not enter.

In any case we have to do, in the philosophical cosmogony, not so much with a difference in type from the theological as with a difference in emphasis or tendency. For the theological myth often conceals under its symbolism a truly intellectual effort to solve the common problem. In the old theological cosmogonies, particularly those of Greece, as we may see in Hesiod, there was much nascent speculation of a philosophical kind; and there is an old Japanese cosmogony which, in the names it attributes to the divine beings and in the order and

¹ A. E. Taylor, *Plato*, p. 436.

progress of their generation, offers strange parallels with modern evolutionary doctrine.¹

When Greek philosophy took up the problem of the cosmogony, its aim was, not to celebrate the mythical labours of the gods in the making of heaven and earth, but to explain by natural causes the existence of the world and the phenomena of nature. While this was so, it was led to postulate a first cause or principle of the universe—a material principle as with Thales, a rational and material principle as with Heraclitus, or a rational and immaterial principle as with Anaxagoras.² But if the first cause were immaterial, how could it act on matter so as to fashion the world? On this question and the answer to it the Platonic cosmogony has an important bearing.

According to the *Timæus*, the Demiurge, or cosmic "craftsman," assumed to be God, found in the beginning a visible mass moving in a disorderly way, and being resolved in his goodness to bring order out of disorder, made the world on an eternal model, giving to it both a body and a soul (including mind or intelligence, which can exist only in a soul). The body of the universe is constituted of fire, air, earth, and water, which arose through his imprinting various mathematical forms and numbers upon primary matter. The soul of the universe consists of all movement, whether of separation or combination, whether of growth or decay. Or, as James Adam summed up the cosmogonic process in Plato: "At the beginning of Time God created the Universe. A spirit or soul went forth from Him" (probably an emanation of His being) "and inhabited the body which He redeemed from chaos by imprinting mathematical forms on primordial matter."³

¹ See *ERE*. iv. 163a.

² This is roughly stated, even of Heraclitus; on Anaxagoras, see further p. 219 f. of the present work.

³ *The Religious Teachers of Greece*, 1908, p. 373.

While we have here an attempt, which may be described as philosophical, to explain the world on dualistic principles, God and the world being conceived as eternally distinct and separate from each other (that is, taking the language of the *Timæus*, mythical as it may be, as it stands), the great significance of the Platonic cosmogony is in this, that already within the movement of the Greek philosophy rational positive science, in this instance mathematical or geometrical science, is being applied to the problem of the world's origin. For it is with rational positive science that the solution now chiefly lies.

From Pythagoras in the sixth century B.C. to Copernicus in the sixteenth century A.D., is a long interval, but it is the interval between the first suggestion of the heliocentric theory and its final establishment, and until the old sacred theory of the universe had been destroyed and the heliocentric theory established there was no real chance for scientific cosmogony. The way was further prepared for the scientific solution of the cosmogonic problem by Newton's discovery of the law of gravitation. But Newton himself advanced no theory as to the world's origin. Of the many relations in the physical universe that are independent of gravity, he was content to say that they were constituted by the Creator in the beginning. Thus, according to Newton, it was as the result of initial impulses communicated by God to the full-formed planets and satellites that the orbits of planets are all nearly circular, and all nearly in one plane; that the planets all revolve in the same direction; and that the planets and their satellites rotate on their axes and are also driven on by tangential or centrifugal forces.

But before a truly scientific cosmogony could be formulated, it was necessary to abandon the deistic

notion of creative act, to which Newton still subscribed, for that of creative process (or creative act giving rise to a process). Here and there in the Middle Ages the opinion had been advanced that the universe is the resultant of a long process of natural development in obedience to an inward principle, and in the sixteenth century Giordano Bruno appears even to have divined the essential idea of the nebular constitution of the universe ; but the first germs of the nebular hypothesis are to be found in the cosmogony of Descartes contained in his *Principles of Philosophy*, published in 1644. Descartes' was a vortical cosmogony, as was Swedenborg's about a century later, being based on the idea of vortices or whirling movements arising in the original nebulous matter, by which the revolving and rotational movements of the heavenly bodies are explained.

It is to Immanuel Kant, however, that the credit belongs of having been the first to formulate a rational cosmogony on Newtonian principles ; so that with his name we pass definitely from theological and philosophical to scientific cosmogony. Kant laboured to prove that the cosmos has attained its present form through the continuous operation of purely physical forces upon a primitive diffused nebula, consisting of finely divided matter. Carrying Newton's conception of the solar system into the star-worlds sunk in the abyss of space, he developed a complete mechanical theory of the origin and construction of the physical universe. He owed much, as it would appear, to the influence of the ideas of a bold and original English thinker, Thomas Wright of Durham.¹

For about a century Kant's treatise,² written in 1755, lay practically unnoticed. The nebular

¹ Cf. W. Hastie, *Kant's Cosmogony*, 1900 (tr.), pp. lxxv-lxxviii.

² *Allgemeine Naturgeschichte und Theorie des Himmels*.

hypothesis, which J. H. Jeans describes as “ of all theories of cosmogony the most enduring and infinitely the most famous,”¹ was in fact chiefly associated until recently with the name of Laplace,² who, in 1796, independently of Kant, gave an original exposition of the mechanical process whereby the solar system—not, as with Kant, the whole cosmos—was evolved from a primitive state of chaos to its present state and condition. The characteristic form taken by the Laplacian, as indeed by the Kantian hypothesis, is known as the ring theory.

Kant started from an original chaos of stationary dust, or finely divided particles of solid or liquid matter, which, under the influence of gravitation, arranged itself as a central body, with rings of dust turning round it; the rings, later on, formed themselves into planets. But, as the laws of mechanics show, no rotation can be set up in a central body which is originally stationary by the influence of a purely central force like gravitation.

Laplace therefore assumed that the primeval nebula from which the solar system was formed was rotating slowly around a central axis. And instead of the cosmic chaos of dust postulated by Kant, we have in Laplace a solar chaos of gas—a fire-mist. In the beginning, said Laplace, the fire-mist must have possessed a globular or spherical form. As it cooled and contracted, the rotation would become faster, and the globe or sphere would be much flattened at the poles, so that it would more resemble a disc, and at last a time would come when successive rings of nebulous matter would be thrown off, to form in one case a ring of small planets, what are now called planetoids, but in general to break up and form each a single globe—the various planets. As

¹ *Problems of Cosmogony and Stellar Dynamics*, 1919, p. 10.

² *Exposition du Système du Monde*.

each globe was formed a similar process would be repeated, successive rings would be thrown off from it, in general to break up and form satellites, but in one case—that of Saturn—to preserve their form and become a ring of small satellites.

“ This world was once a fluid haze of light,
Till toward the centre set the starry tides,
And eddied into suns, that wheeling cast
The planets.”

Thus both Kant and Laplace try to develop a theory in which a system such as the rings of Saturn represents a half-way stage in the general process of the formation of planets and satellites from the primitive nebula. Neither theory explains on dynamical principles why the supposed ring system should become unstable and agglomerate into planets, or why the rings of Saturn have not also become unstable.

But the essential idea of the Kantian and Laplacian theory, namely, the nebular origin of the world, has survived, and meets with almost universal acceptance among physicists; and it is worth remembering that the theory was formulated before the existence of nebulae was actually proved. Thanks to the invention of the spectroscope, we now know that real nebulae, which no telescope could resolve into clusters of stars, are to be found in the heavens in thousands. Indeed, as Sir William Herschel contended long ago, if we view celestial objects aright we shall behold in them varieties of form corresponding to varieties of stages of cosmic development. Even as in the forest, to adopt his own beautiful analogy, we see around us trees in all stages of their life-history—the seedlings just sprouting from the acorn, the slender saplings, the sturdy oaks in their full vigour, those also that are old and

near decay, and the prostrate trunks of the dead—so also in the celestial universe we may behold in nebulæ and star-clusters and suns and Jupiters and earths and moons the history of the great cosmic process.

But it is time to listen to more recent voices than Kant and Laplace, whose cosmogonies after all, if of the scientific type, were highly speculative in character. Since their day scientific conclusions on cosmogony have been founded more closely on observation and calculation, and on a better knowledge of the laws of matter and motion. An attractive modern theory, designed to displace the characteristic Kantian and Laplacian ring theory, or rotational theory, of development, is the theory known as the tidal-action theory, associated with the investigations of Sir G. H. Darwin. I should like briefly to expound a particularly attractive form of this tidal-action theory first advocated by Professors Chamberlin and Moulton of Chicago.¹

The theory finds alliance with the meteoritic hypothesis brought into vogue by Lockyer in 1890, according to which the nebula consists not of white-hot gas, as Laplace thought, but of a vast swarm of solid meteorites, such as may be seen in a cloudless night as shooting stars flashing intermittently across the sky. Seeing that many of the meteorites are members of the solar system, and not merely immigrants into it from outer space, Chamberlin has named them planetesimals, as being infinitesimal planets travelling in regular orbits around the sun; and in his application of the meteoritic hypothesis to the problem of cosmogony, and more especially to that of geogony, the planetesimals play an important part.

It was one of the difficulties of the Laplacian

¹ See T. C. Chamberlin, *The Origin of the Earth*, 1916, *passim*.

gaseous theory of the nebula, how material so extremely diffuse—of a density, Lord Kelvin estimated, one-millionth of that of ordinary air—could remain incandescent through its own heat. According to the meteoritic hypothesis, the heat lost by radiation in space is recovered more or less by collisions.

It was, as already hinted, another of the difficulties of the Kantian and Laplacian rotational theory, in which the intermediate phase of cosmic development is represented by a system like Saturn's rings, how the rings of nebulous matter became unstable and were agglomerated into planets. Instead of a rotational theory Chamberlin operates with a theory in which, not the rings of Saturn, but the spiral nebulæ which have been recently disclosing themselves in such vast numbers to the telescope, provide the intermediate phase aforesaid, and in which tidal forces play the preponderating part in effecting the birth of planets and satellites.

There were other difficulties in the way of the Laplacian hypothesis, into which I shall not enter, but which the planetesimal and tidal-action theory of Chamberlin and Moulton seeks to overcome.

According to this theory, then, the conditions of the cosmogonic problem may be met, so far as the solar system is concerned, by the hypothesis that at one time there was a collision between two stars, one of which was our sun. An actual collision need not, however, be postulated, only a dynamic collision. As a result of such a collision or encounter, the earth, with the whole planetary system, was formed from the actual substance of the sun itself.

Here is the illustrative instance, selected to suit the problem.

Let the sun, in its ancestral state, be the body approached. Let the approaching body be another star, more massive than the sun. To the inherent

properties, energies, and activities of the sun there are thus added the gravitative potencies of a great star passing by. The effect, in accordance with the law of gravitation, would be a tidal elongation of the sun along the line joining its centre with the centre of the passing star. Such a tidal elongation would take the form of bulges on opposite sides, one towards the attracting body and one away from it. The eruptive forces within the sun would also ease themselves along the line aforesaid, which would be the line of reduced gravitative pressure, and one set of eruptive projectiles would be shot directly towards the passing star, and another set in the opposite direction.

Some of the projectiles from the sun would be short-distance projectiles, and would fall back again to the sun. Some would be long-distance projectiles, and would escape from the sun's control, and, in some instances, even from the star's control. But some would be neither short-distance nor long-distance, but intermediary, and these would be the planetary group of projectiles.

If now we are able—not an easy thing to do—to visualise the sun after the influence of its partner in action has ceased to operate, it will show the appearance of a spiral nebula, which is a disc-like formation of nebulous matter distributed more or less regularly in or near a single plane in spiral form. For during the stages of closest approach the relative positions of the sun and the star were rapidly changing, and the tidal bulges constantly shifting their positions in the sun and their directions in space, with the consequence that the successive gas bolts took new directions at each successive instant, and as a mechanical necessity the chain of such successive bolts assumed the shape of a spiral.

Thus in the beginning the solar nebula (which was

a nebula evoked from the sun and not, as in the inherited theory, one that condensed into the sun) was little more than a streaming knotty pair of arms of nebulous matter shot out from the sun and curved into spiral appendages about it by the joint pull of the sun and a passing star.

Great knots or belches of solar matter would give rise, in the course of time, to the giant planets, Jupiter, Saturn, Uranus, and Neptune ; lesser knots would give rise to Venus and the Earth ; lesser ones still to Mars and Mercury, and so on. The necessary aggregations of matter would be effected by the direct condensation of gaseous centres, by the collection of particles of knots revolving around the sun or around such centres into solid cores, and—not least important—by the gathering of planetesimals into the knots, or into the solid cores. The planetesimals, or infinitesimal planets, play indeed a great part in the upbuilding of the planetary system. They were the scattered products of dispersive action. At the high temperature at which they were shot from the sun they passed beyond the control of the parent bolts, and issued into open space as free molecules and small aggregates of matter no longer in gaseous form. There they followed orbital paths of their own until they became absorbed by the planetary bodies—although myriads upon myriads of them still pursue their orbits in space, within the sun's sphere of control.

Such, then, is a recent scientific conjecture on the question of cosmogony : the solar system the result of the long genetic development of a spiral nebula, largely composed of meteoritic matter, though containing gaseous, liquid, and solid nuclei ; and the spiral nebula itself the result of a dynamic collision or encounter between the sun and a passing star ! The creation of the planetary system an incident in

the history of the sun ! The genesis of the sun an incident, not improbably, in the history of the stellar galaxy ! The genesis of the stellar galaxy perhaps only an episode in the evolution of the vast universe that undoubtedly lies chiefly beyond our ken !

A cosmical theory such as this remains, at the best, of a speculative character, but it is scientific and not metaphysical speculation, and the results that follow from the selected illustrative instance are demonstrated by those abstruse and elaborate mathematical calculations in which the astronomical theorist must needs be a master.

Having supported the statement that the problem of the cosmogony is one which, in our Western world at least, theology, philosophy, and science have successively tried to solve, and having shown that the solution of the problem now largely rests with science, I go on to support the further statement that theology and philosophy still retain a vital interest in the problem, and at the same time to show that a practical delimitation of the spheres of science and religion appears possible, in this reference, in our age.

We are told—it is inevitable that I should cite the story—that when Laplace presented to Napoleon his work on the origin of the solar system, Napoleon—himself no inconsiderable mathematician—said to him : “ Newton has spoken of God in his book. I have already gone through yours, and I have not found that name in it a single time.” To which Laplace answered, “ Sire, I have no need of that hypothesis.”

What Laplace meant by such words is not certain. Probably his answer was not a profession of atheism. But let it stand for the truth which is being increasingly recognised both by theology and by philosophy, that the exposition of the process whereby worlds are

fashioned belongs to physical science, and to physical science alone. No longer, as in the Middle Ages, does a philosophical dogma like that of the incorruptible quintessential heavens, or a theological dogma like the sacred theory of the universe, offer a barrier to scientific investigation and progress.

It is one thing, however, to expound a process, and another to explain, *i.e.* interpret it, and we have seen that the modern scientist is thoroughly conversant with the distinction. A generation ago science was tempted to claim too much for itself, as the last of the three Comtian states or stages of knowledge; nowadays its claim is comparatively modest, sometimes perhaps over-modest. The formulas of physical science have been variously characterised as symbols or counterfoils of reality, as a kind of conceptual shorthand descriptive of the routine of our perceptions, as economies of thought, as convenient hypothetical summations, or, in J. Royce's favourite metaphor, as the ledger entries and balances of a particular method of book-keeping. It is open to physical science, as he truly remarks,¹ to enter its accounts by other methods of book-keeping. Gravitation, for example, may yet be explained as a mere appearance of some more genuine process of nature. But however physical science may characterise its formulas, it has been learning to appreciate the distinction between scientific description or explanation and that ultimate explanation which I should include under the term "interpretation." Materialism and naturalism are ultimate positions, but the exact sciences as such are by no means committed to a materialistic or naturalistic standpoint. "Of absolute origins," says E. W. Hobson, apropos of cosmical theories, "Science knows nothing, and we can form no conception.

¹ *The World and the Individual*, Second Series, 1901, p. 216.

The so-called primordial state, such as is postulated in the nebular hypothesis, presents a problem which we do not attempt to solve.”¹ The position is further illustrated by Lawrence Henderson in *The Fitness of the Environment* (1913): “There is little room for doubt that a complete *description* of cosmic evolution in terms of matter and energy is possible, for it is sound scientific doctrine that what exists in the finished solar system depends upon what already existed in the nebula.” But he continues: “Whatever else it may achieve, mechanism can never *explain*, cannot even face the problem of the existence of, matter and energy. Within the world of science these are conserved; only outside that world can they have originated or not originated.”²

Here, then, is suggested not merely a division of labour as between science on the one hand and philosophy and theology on the other, but also a distinction of spheres, and philosophy and theology may bid science a sincere God-speed on its way. For while the scientific or positive is the last of the three states or stages described by Comte, now that science has come to its own the law of the circuit is more and more asserting itself, and to philosophy and theology their tasks are restored again, if in purified form.

What, then, let us first ask, should be the attitude of philosophy to the problem of cosmogony? It is the business of philosophy, as I take it, to seek for the explanation, *i.e.* interpretation, behind the description, to discover the strategy behind the tactics, to set forth, if it may, the workings of that which is real and ultimate in the mysterious universe. It is, therefore, understandable that in such a question as this of cosmogony, the modern philosopher tends

¹ *The Domain of Natural Science*, p. 315.

² P. 307.

to wait upon science. In the days of old Greece, as Burnet remarks,¹ every serious attempt to grapple with the ultimate principle of reality brought with it a great advance in positive science. Perhaps we should rather put it this way in reference to our modern age: every great advance in positive science brings with it a new attempt to grapple with the ultimate principle of reality. It is true that there is a pronounced tendency among modern philosophers to make the main business of philosophy consist in providing a logical basis and a methodology for exact science; but the speculative tendency still maintains itself, and metaphysical philosophy has never looked upon the developments of exact science with a deeper interest, even welcoming the incursions of individual scientists into the field of metaphysics. Such incursions are particularly welcomed by a spiritual philosophy (and I am fain to believe that there is a pronounced spiritual trend in modern philosophy), if they take such a form as this—the words are T. C. Chamberlin's, and they are appended as a significant postscript to his book on *The Origin of the Earth*: “It is our personal view that what we conveniently regard as merely material is at the same time spiritual, that what we try to reduce to the mechanistic is at the same time volitional.”

And what should be the attitude of theology to the problem of cosmogony? In such a matter the theologian tends now to wait both upon philosophy and upon science. On the one hand, he leaves it to metaphysics to discuss ultimate questions of cosmology, such as the question of the origination (or non-origination) of matter and energy. It is true that if he is a Christian theologian, he has usually a doctrine of divine creation to uphold,

¹ *Greek Philosophy*, 1914, pt. i. p. 11.

regarding such as an implicate of the Christian religion. But he does not necessarily go to the Bible for light upon the nature of the creative process. Did God create the substance of the world out of nothing, or otherwise, in the beginning of time? Or is the substance of the world eternally created? Such questions are being excluded more and more from the purview of theology.¹

It might be here remarked that the doctrine of the creation out of nothing is not affirmed in the cosmogony of Genesis, and although it appears in ecclesiastical dogma, it never satisfied theologians of the type of Origen, Augustine, Scotus Erigena, or Thomas Aquinas. Thomas said that the doctrine of the creation out of nothing must be received by faith alone. In modern theology the emphasis tends to be laid not so much on the idea itself as on the truth it conserves. For example, W. Adams Brown says in his well-known textbook: "The real significance of the doctrine of creation *ex nihilo* to the Christian is to be found in its denial of such theories (dualistic or emanistic) as are inconsistent either with the real existence of the universe for God or with its complete dependence upon God."²

It might also be here remarked that, under the influence of the movement of modern philosophy from Descartes to Hegel, the notion has gained currency among theologians that perhaps God cannot be properly conceived of as existing without creative activity, or, in other words, that creation is an eternal act. As Scotus Erigena expressed it in the *De Divisione Naturæ*, vision does not come before operation. As a modern philosopher has expressed it, the basal constitution of the universe is eternally complete.³ Says V. F. Storr (and other theologians

¹ Which is to say, the dogmatician need not be also a religious philosopher or philosophical theologian.

² *Christian Theology in Outline*, 1906, p. 213.

³ A. S. Pringle-Pattison in *The Spirit*, 1919, p. 17.

besides might readily be cited): "The significance . . . of the idea of Creation does not lie primarily in the thought of making something out of nothing, but rather in the thought of the self-expression or self-revelation of God. But, if this is so, are we not driven to think of Creation as an eternal activity? If it is God's nature to reveal Himself, must He not always have been doing so? Must He not always have expressed Himself in a universe?"¹

But whatever may be the truth in such matters, they are not matters in which theology is so much interested as it once was. It is no longer necessary for the theologian to put off the curious when they ask, for example, what God was doing in the eternity before the world was. Said Luther, as we are told: "He was in the birchwood cutting a rod for impertinent questions!" Said a certain person quoted by St. Augustine, and approved of Calvin: "He was preparing hell for priors into mysteries!"² All that the theologian need ask of philosophy is that the world and all things therein be recognised as derived from God and as continually dependent upon Him. Ultimate problems he may well hand over to philosophy, even though its answer should be, "Man is born not to solve the problems of the universe, but to find out where the problem begins." *Prudens quaestio dimidium scientiæ.*

On the other hand, as the modern theologian tends to leave ultimate problems of cosmology to metaphysical philosophy, so he leaves it to natural science to expound the cosmogonic process. He does not oppose the Creation story in Genesis to the cosmogonies of modern science. It is with the theological cosmogonies of ancient religion generally, and of Babylonian religion in particular, that the first chapter of Genesis is properly to be compared. The

¹ In *The Inner Life*, Second Series, 1925, p. 4.

² *Conf.*, xi. 12.

Mosaic cosmogony, as it is named, may reflect the science of its time, or even be an advance upon it, but it is by theological and not scientific standards that it is to be appraised. And the theological differences between it and the "Cosmogonic Epic" are profound. In the one case we meet with a teeming mythology, gods many and lords many; in the other a pure and lofty monotheism: in the one case the emergence and evolution of the gods out of primeval chaos, and Marduk struggling hard for supremacy; in the other, God the Creator from the beginning and His supremacy unchallenged. It is the abiding value of the Hebrew story that it has thus purged and purified the old Babylonian story in the interests of the essential theological idea, that there is but one God and His sovereignty is absolute. It is not for authoritative information on the cosmogonic process that the modern theologian goes to the Bible. He approves the spirit of the words attributed (no doubt wrongly) to Galileo on the inquisitorial rack: "My Bible tells me how to go to Heaven, not how the heavens go."¹ He is persuaded that he may accept the nebular or any other genetic theory of the origin of the world, or of worlds beyond our ken, and yet still believe with the writer in Genesis in One who in the beginning created the heaven and the earth.

Theologically speaking, we are almost inclined to say, it is a matter of indifference whether God created the world, as we now see it, by a single act or through a continuous process; it is still the product of a fiat of His will. Yet hardly a matter of indifference. It may justly be claimed for the new knowledge of our

¹ In his treatise on *The Authority of Scripture in Philosophical Controversies*, 1614, Galileo cites the opinion of an ecclesiastic raised to the degree of Eminentissimo, that the intention of the Holy Ghost is to teach us how to go to Heaven, and not how the heavens go.

time that it has made God, so to say, greater than before, that it has enlarged our conception of Him and of His "ways." The heavens still declare the glory of God, and not the glory of Kepler, or Newton, or Laplace; but they declare His glory, and the firmament shows His handiwork, in a more surpassing sense than even the Hebrew poet knew.

It may also be justly claimed that the new knowledge of our time has brought God, so to say, nearer to us, that it has deepened our conception of Him and of His "ways," and even lent support to the religious sense and consciousness of His abiding presence. We have learned to see in God not only the oldest of workers, but a Worker who never ceases nor even relaxes from His work. "My Father worketh hitherto, and I work," said Christ.¹ In place of One whom we were once tempted to think of as dwelling beyond the stars, in the transcendent heaven of His glory, we now have One who is ever immanent, and at the same time transcendent, in the world which He is ever sustaining, and in which His Mind and Purpose is ever being unfolded.

"My heart is awed within me when I think
Of the great miracle that still goes on
In silence around me—the perpetual work
Of Thy creation, finished yet renew'd
For ever."

For the rest, we may go forward into the experiences of life with the lamp of religion or without it. But I think it may be truly said that modern philosophy is on the side of those who keep their lamps lighted, and modern science will not quench the flame.² Only it must be a flame of pure and true religion that is kindled; otherwise a spiritual

¹ John v. 17.

² S. A. Mellor, *Religion as affected by Modern Science and Philosophy*, 1914, p. 198.

philosophy will refuse to be associated with our theology, and a progressive science will ignore it utterly. The theologian must learn that as first things come first, he should throw the emphasis of His witness to God on the ethico-religious experience, while remaining openly receptive to the scientific knowledge of his age, and at the same time abandoning the foolishness and the faithlessness of defending discredited causes.

Some of us have yet to learn this lesson. In some theological circles to-day, as in the Hutchinsonian theology of the eighteenth century, Moses' *Principia* is still opposed to Newton's *Principia*! But the barriers of theological prejudice have so largely broken down that, despite such a phenomenon, Huxley, were he alive to-day, would scarcely need to reiterate his complaint that in so many fields the peremptory signboard with its imposing signature still blocked the way of scientific progress and enlightenment, "No thoroughfare—Moses!"

"Science was Faith once ; Faith were Science now,
Would she but lay her bows and arrows by
And arm her with the weapons of the time.
Nothing that keeps thought out is safe from thought.
For there's no virgin-fort but self-respect,
And Truth defensive hath lost hold on God."

CHAPTER VIII
THE ORDER OF NATURE

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THE ORDER OF NATURE

IN the second chapter I said that natural theology looks upon the world as God, or as revelational of Mind, Spirit, Will, Purpose ; and that natural science looks upon it as Nature, or as revelational of natural or rational laws, principles, and processes. In the fifth chapter I said that natural theology *interprets* the world as God, or as revelational of Mind, Spirit, Will, Purpose, and that natural science *describes* or *explains* the world as Nature, or as revelational of natural or rational laws, principles, and processes. In the one case the world is viewed *sub specie æternitatis*, in the other *sub specie uniformitatis*. Perhaps we shall better appreciate the distinction between interpretation and description or explanation as the functions of natural theology and natural science respectively if now we take a wider view of the natural world, regarding it not only from the standpoints of natural theology and natural science but also from the standpoint of ordinary workaday experience.

Consider the last standpoint first. As we look abroad upon the natural world, it shows us as a rule the appearance of a more or less ordered plurality or manifold. Earth and sea and sky, trees and flowers, beasts, birds and fishes, the tribes and races of mankind, and the multitudinous products of human brain and hand—such are the components of the natural world, and they are massed together in endless variety. No doubt if we have particular

aptitudes or interests we recognise and respond to some things in our world more readily than to others. We may have an eye for line and form, for colour, or for light and shade, an ear for rhythmic sound, a soul for beauty. But whatever our aptitudes or interests may be, it is on the whole an external view of the world which most of us ordinarily take, in which the impression on our minds is one of manifoldness.

When we consider nature and created things from the standpoint of natural science, as distinguished from common or public experience, it is another sort of view that offers itself. In this case the sense of nature's order is more highly developed than in the case of common observation and experience, nature being viewed not so much as an ordered manifold as an ordered and continuous unity. What the scientist seeks to discover are the elements that compose the universe, and the principles according to which these are combined together. He would dissect the world of nature as the anatomist dissects the body, showing its various nerves and arteries. He would expose "the skeleton of the natural texture," as J. T. Merz phrased it, "around which the listless hand of Nature weaves its picturesque variety of actual things and events."¹ Thus it is an inward and unitary aspect of the world with which natural science chiefly concerns itself. It is not so much concerned with line, form, colour, sound, or with the exterior aspect of nature in general. Such outward manifestations it tends to eliminate from its world of discourse, concentrating its attention upon elements and processes, which it endeavours to harmonise and unify.

There is yet another standpoint from which the world may be viewed, that of natural theology.

¹ J. T. Merz, *A Fragment on the Human Mind*, 1919, p. 225.

Here it is not the outward aspect of the world, nor even the inward aspect, that is in question ; it is what we may call the ultimate aspect, it is what lies behind the unity in variety, and is a sufficient explanation of it. And natural theology stands for a spiritual outlook upon nature, in this being allied with religion and spiritual philosophy. Mystical religion and philosophy sometimes behold in nature the divine garment, trace in it the divine footprints, " the vestiges of creation," are wedded to this goodly universe in love and holy passion. But mystical religion and philosophy are not alone in their essential attitude to the world. Normal spiritual religion, like spiritual philosophy in general, may also regard the world as manifesting Mind or Spirit. The interest of religion and spiritual philosophy is not in the question of what the world is, when outwardly or inwardly viewed, or of how it has come to be what it is—not in the questions of the What and the How, but rather in the questions of the Whence, the Whither, and the Why, and the last-named not least. Origin, destiny, and, more particularly, meaning or purpose—by such terms is conveyed the attitude of religion and spiritual philosophy, which is also that of natural theology, to the problems of the natural world.

The natural world, then, may be regarded from a threefold point of view, which we may roughly name the outward, the inward, and the ultimate. The outward point of view represents the standpoint of ordinary experience, which gives us nature as an ordered plurality or manifold ; the inward point of view the standpoint of natural science, which gives us nature as an ordered or systematic unity ; and the ultimate point of view the standpoint of natural theology, from which nature appears as a manifestation of Mind or Spirit. In this case it is not the

varied aspect of the world that is considered, nor even the unitary aspect, but what lies behind and explains the variety and the unity.

Or to catch this up again from the side of the object instead of from the side of the subject, from the side of nature itself rather than from the side of the observer or investigator of nature, nature may then be said to present to us a threefold order—a common or public order, a scientific order, and a spiritual order. By the common or public order I mean the order which is revealed to us immediately in experience, even to relatively superficial observation; by the scientific order I mean the order which is revealed to expert analysis and synthesis; by the spiritual order I mean the order which is revealed to philosophic or religious insight. Inasmuch as we are all more or less endowed with powers of simple observation, all more or less equipped with the logical or methodic instruments of science, all more or less philosophically or religiously minded, we may all acknowledge the order of nature in this threefold aspect.

To say, for example, that the sun rises in the morning and sets in the evening relatively to the earth, is to acknowledge and trust the common or public order. Again, to say that every body in the universe attracts every other with a force which varies directly as the product of their masses and inversely as the square of their distance, is at once to place your faith still in Newton and to acknowledge the scientific order. Yet again, to say that underlying the world of fact, whether as revealed to common sense or to scientific analysis and synthesis, and really predominant over that world, there is a world of meaning, purpose, value, is to acknowledge the spiritual order. When we seek to express that meaning in terms of language, it is

the language of religion and spiritual philosophy that we use.

That there *is* an order or system of nature, that we live in a Universe and not a Multiverse, is a well-nigh universal assumption or intuition. It is significant in this connection that in the Greek and Latin languages the world is designated "the order" (*ὁ κόσμος*, *mundus*), and that these designations are also used in our modern Western tongues.¹ It is belief in the orderliness or systematic character of nature that makes natural science possible. As Huxley said in his Romanes Lecture, natural science requires one primary act of faith from all who would enter its fellowship, faith that law is operative always and everywhere, that every effect has its adequate cause, that the universe is an intelligible whole and not a mere fortuitous congeries of entities of which nothing can be affirmed with certainty.

It may also be observed that the advance of natural science but serves to reinforce the belief in the orderliness or systematic character of nature. As we pass through new gateways of knowledge we find the same "sentinels of order" keeping watch and ward. The chemistry of the stars is the same as the chemistry of the solar system: "The same light throbs in their immemorial rays as in the sunbeam."² Order would certainly appear to be *nature's* first law. In fact, as V. F. Storr well insists, nature must be assumed to be an orderly system from the first. Chaos is unthinkable. "To postulate chaos as the *fons et origo* of the order that exists is to use language which has no meaning."³

¹ A. N. Whitehead, in discussing the vivid implanting in the European mind of this "instinctive conviction" that there is an order in things, traces it to the mediæval insistence on the rationality of God. See *Science and the Modern World*, p. 17.

² E. Griffith-Jones, *Providence—Divine and Human*, 1925, p. 120.

³ *Development and Divine Purpose*, 1906, p. 92.

Further, that the order of nature as known is in the first instance a common-sense order is generally realised, and I need not labour the point. This order is constructed out of the original chaos of our sensations, feelings, and endeavours, out of the jumbled contents of immediate consciousness, and constructed in the main by unreflective processes of thought and imagination. It has been characterised very aptly by L. T. Hobhouse as "the workaday world as it presents itself to the average civilised man, outside the scientific laboratory, the church, or the lecture-room."¹ Its conceptions, being the conceptions of common sense, may accordingly be loose; its generalisations, being the generalisations of common sense, may accordingly be arbitrary and uncritical; none the less a genuine order of nature has been slowly but surely evolved by common sense, so that with the fruition of the organising activities of common sense, nature is regarded, as already said, as an ordered manifold. Nor need I labour the point that there is a scientific order of nature. In the scientific sphere we have to do no more with picture and merely pictorial symbols, but rather with logical principles. Here we meet with the so-called laws of nature, such as gravitation, the conservation of mass, the conservation and the degradation of energy, and so on; here, too, we meet with the principle of evolution, applicable alike to the origin of worlds, as in the nebular hypothesis, and to the origin of species, as in the theory of descent.

As for the spiritual order, how shall we distinguish it more clearly from the two others with which we have associated it? We might say that whereas the common or public order, or the order of the market-place, and the scientific order, or the order of the laboratory, are both of them empirical orders,

¹ *Development and Purpose*, 1913, p. 100.

as being founded on the data of sense-perception, the spiritual order is speculative or intuitive in quality. Whereas, again, the common or public order belongs to the stage of recognition in conscious life, and the scientific order to the stage of contemplation, the spiritual order belongs to the stage of evaluation or appreciation, or at any rate belongs to it pre-eminently.

It is not so very long ago since it was a common belief among natural scientists that they alone were in a position to offer a valid appreciation of reality. Hear what an able contemporary scientist says on this point: "Writers on the scientific side in the last century such as Clifford never realised that because of the very methods of science it has its definite limitations, not in subject-matter, but in technique. Word-symbolism, averages, approximations, statistical data, general laws—in every application of the scientific method the individual always escapes and we construct a world corresponding only very inaccurately to the world of reality. . . . In order to correct the distortions of vision," he adds, "which we must of necessity suffer when we apply the scientific method, we must have recourse to the other methods of human perception, we must philosophise, appreciate beauty, and make use of our faculty for mystical experience."¹

It is when we philosophise, and our philosophising leads us to a spiritual and theistic conception of the Ultimate Ground of the universe; it is when we wait upon spiritual or mystical experience, and our waiting leads us to a truly spiritual conception of the Supreme Value of the universe; it is when theistic philosophy and spiritual or mystical experience join hands together to the enlargement and enrichment of our conception of God, the Ultimate

¹ A. S. Eddington in *Science, Religion, and Reality*, p. 209.

Ground and the Supreme Value—it is then that we may interpret nature as a spiritual order, in rich, full, and satisfying sense. Of religion as well as philosophy it may be said :

“ I am the eye with which the Universe
Beholds itself and knows itself divine.”

Now with the threefold order of nature, as above stated, I would associate a threefold set of terms commonly employed, more or less loosely, in modern discussions of the world and its meaning ; namely, the terms description, explanation, and interpretation, which have been already before us.

Description may be of a popular or pictorial sort. Where popular or pictorial description becomes art in the specific sense of the word, it is embodied in expressive language, whether of prose or of poetry, or it may take for its instrument the artist's pencil, brush, or chisel. But, on the other hand, description may be of a generalised sort, and generalised description is, as we have seen, commonly represented by modern scientific theorists as the aim and end of natural, and more especially physical, science. Here the viewpoint is inward rather than outward ; and it is the framework of nature, “ the skeleton of the natural texture,” that is described, rather than its concrete embodiments, the endeavour being to effect the description in terms as simple, general, and abstract as possible.

But natural science has to do both with what nature is in principle and with the processes by which it has become what it is. Nature, as we might say, is regarded in natural science both statically and kinetically, both systematically and genetically. Accordingly, it would put a strain upon the term “ description ” to employ it as designating the whole aim of natural science, especially as we must at least

include under natural science biological as well as physical and chemical science. Perhaps if we were to supplement the phrase "generalised description" with the phrase "genetic explanation," we should have a more adequate expression of the proper sphere or function of natural science.

None the less, it might be a great convenience if the term "description" were associated not with the scientific order of nature but entirely with the common or public order, and the term "explanation" taken as the term to be associated with the scientific order. Then the common order would belong to the world of description, the scientific order to the world of explanation, and the spiritual order to the world of interpretation.

To recall the illustrations already cited. To say that the sun rises and sets every day, relatively to the earth, moving from the eastern to the western heavens, is no doubt, as Copernicus has taught us, to speak popularly and pictorially, but it is to give a good working *description* of a natural phenomenon. Again, to say that Newton's law of gravitation is the complete dynamical pattern of the solar system, if not of the sidereal universe, is no doubt, as philosophy of science teaches us, to speak abstractly and in general terms, but it is to give a satisfying *explanation* of the planetary movements, enabling astronomers to go about their business of measurement, calculation, formulation, and prediction. Yet again, to pass beyond the tasks of describing the common order and of explaining the scientific order, both of them empirical tasks, and to say, for example, that through the ages there runs a divine Purpose, or an increasing divine Purpose—the establishment, shall we add? of a spiritual kingdom of selves or persons which shall mirror the eternal love and goodness—is no doubt to use the language of philosophical

reflection or of religious faith, but at the same time it is to offer an *interpretation* of the world's meaning—an interpretation which appears to commend itself alike to the theism of reflective thought and the theism of the religious consciousness, but for whose verification we can only cast ourselves upon the future.

It might be said by many that thus to employ the terms, description, explanation, and interpretation, would be a gratuitous form of terminological heresy. Is it not sound and settled doctrine, they might ask, that natural science now leaves explanation to metaphysical philosophy, claiming only descriptive validity for its own formulas? Listen to what Kirchhoff said (even half a century ago) of the task of mechanics: it is "to describe completely and in the simplest manner the motions which take place in nature." Or to what Pearson has said of the law of gravitation: "It simply resumes, in a few brief words, the relationships observed between a vast range of phenomena." Or to what Poynting has said of physical laws generally: "A law of nature explains nothing, it has no governing power, it is but a descriptive formula which the careless have sometimes personified." Or to E. W. Hobson's account of the nature of a scientific theory (and he includes biology as well as physics in his purview): "A conceptual scheme, designed by the synthetic activity of the mind, working with the data of perception, for the purpose of representing particular classes of sequences and regularities in our percepts."

What I should answer is that physical science, and natural science in general, suffers at present from an attack, perhaps reactionary in quality, of undue modesty. It may indeed be the case that scientific explanation is to be distinguished from philosophical explanation as being only generalised

description. But it should be remembered that behind the descriptive formulations of science, which are very different from merely pictorial things, there lie worlds of patient observation and experiment and hosts of flashing inspirations. And remembering this, we may well be inclined to yield to science the larger claim which appears to be involved in the term "explanation," especially if in the spheres of metaphysical philosophy and religion we employ the term "interpretation" in the sense of ultimate explanation. "It is an interesting point," remarks J. Arthur Thomson in his Gifford Lectures—and the remark supports my suggestion as to the use of the terminology under discussion—"that just about the time when Physics began to claim emphatically that its office was to describe and not to explain, Natural History in Darwin's hands passed emphatically from description to historical explanation."¹

It might then be, as I suggest, a convenient thing to associate description with the common or public order of nature as constructed by common sense, explanation with the logical or methodical order of nature as exhibited by the natural sciences, both the physical and the biological, and interpretation with the spiritual order of nature as discovered by or revealed to metaphysical philosophy and religion. I should not, however, press for such a use and association of these terms, nor shall I even try to conform to it consistently myself. For when we pass from the common order of nature to the scientific order we experience, doubtless, a profound sense of nature as a unitary system, yet it is across no well-defined frontier that we move. No hard-and-fast line can be drawn between the two orders. While I would attach the term "description" to the representations of the common-sense order, and the term

¹ i. 13.

“explanation” to the representations of the abstract and generalised order of science, I recognise that the terms must not be rigidly employed. Indeed, the average civilised man to-day cannot but see deeper into the workaday world than his forefathers did, and his apparently formal or *de facto* observations of it tend to become so generalised, so abstract and theoretical, as to facilitate the mind’s transition to the scientific order.

But my main object in suggesting this use of terminology has been accomplished; it was, under cover of the suggestion, to emphasise the threefold aspect of nature’s order to which I have been inviting attention, and which will provide a form for the subsequent discussions.

So far, then, in elaboration of the point that whereas natural theology is concerned with the interpretation or ultimate explanation of the world—that is, so far as it may be interpreted or ultimately explained apart from moral and religious experience—natural science is concerned with generalised description and genetic or historical explanation.¹

Now the first two orders of which I have spoken have this in common, that they are both of them empirical orders. It is philosophic or religious insight which transforms and transfigures them into the last-named order, the spiritual. And when philosophic or religious insight unfolds, as it were, its mental process, it usually expresses itself in terms of the familiar theistic argument from order, loosely and popularly known as the argument from design, and technically called the physico-theological or teleological argument. (It would be better named the cosmological, as being the argument from the

¹ For a discussion of the idea of interpretation, see J. Royce, *The Problem of Christianity*, 1913, vol. ii. lect. xiii.; also W. R. Sorley, *Moral Values*, etc., lect. xi.

ordered universe, only that this is the designation usually given to the argument from causality, or the ætiological argument, which proceeds from the contingency of the cosmos to its First Cause.)

We may allow that from the strictly logical standpoint the argument from order to design or purpose and from design or purpose to God, is—as Kant said—fallacious; and when the fallacy in question is named “the fallacy of transcendent inference,” our sense of the logical enormity involved in the argument is appreciably deepened!

But the argument from design is the plain man’s argument, and the plain man’s argument rests upon the plain man’s logic, and the plain man’s logic, if not the logic of the schools, is perhaps something deeper and more real. Let us call it the logic of the heart. And to encourage the plain man to stick by his logic, and to trace the hand of God directly and immediately even in the common order of nature, let us recall for him the stout testimony of no less a thinker than Francis Bacon: “I had rather believe all the fables in the Legend, and the Talmud, and the Alcoran, than that this universal frame is without a mind. . . . While the mind of man looketh upon second causes scattered, it may sometimes rest in them, and go no further; but when it beholdeth the chain of them, confederate and linked together, it must needs fly to Providence and Deity.”¹ Let us even recall for him the testimony of Immanuel Kant himself, whose earliest published reflections upon the philosophy of religion were chiefly concerned with the impression of design or purpose conveyed to our minds by the spectacle of nature, particularly of the starry heavens. It is true that for Kant in his maturer reflections there was a chasm separating the world of facts from the

¹ “Of Atheism,” *s.i.*

world of values, but he could always bridge the chasm by a venture of faith: "Reason . . . cannot be so depressed by the doubts of subtle and abstract speculation as not to be roused from the indecision of all melancholy reflection, as from a dream, by one glance at the wonders of nature and the majesty of the universe."¹

It is but to reinforce the argument from design to turn from the common order of nature to the scientific. Even if the mechanistic hypothesis were true, according to which the phenomena of nature, both inorganic and organic, are all reducible, scientifically speaking, to terms of mass and motion, it would not necessarily follow that the idea of a Supreme Mind and Intelligence manifested in the natural world would be untenable. So far from—in Baconian language—inclining the opinion to atheism, the scientific order, like the order of common sense, should bring about men's minds to religion. In other words, the scientific order may be made the basis of a transcendent inference, or at least of a *salto*, whether of philosophic or religious faith, in the direction of the transcendent. For the expositions or representations of natural science, as already urged, are not to be regarded as ultimate explanations. Science looks upon nature, and seeks to penetrate its texture, in the hope of discovering What is there, and How it came there. But it does not face the deeper problem of the How, nor does it face at all the problem of the Why; and even if, to quote Cournot's language, it recognises "the mysterious chain of finality" in nature, it cannot demonstrate the chain's "origin and term." Therein ultimate problems are involved, and if such problems are to be solved or even discussed at all, natural

¹ *Kritik der reinen Vernunft*, A624, B652, ed. R. Schmidt, 1926. See N. K. Smith's *Commentary*, p. 538.

science must be supplemented by metaphysical philosophy ; and, as we may here add, it is only with a spiritual metaphysics that religion can live.

I once came across a word in this connection that took my fancy. It was devised in all sobriety to describe the man who interprets the scientific order of nature spiritually, that is, as evidencing Mind and Intelligence. If you have outgrown the old argument from design, and if you fear that to call yourself a teleologist still, in the transcendent reference of the term, is to write yourself down an obscurantist in thought and belief, then, perhaps, you might call yourself a "eutaxiologist," and your teleological argument the "eutaxiological argument." A eutaxiologist, if language means anything, should be a person who subscribes to a doctrine of order, or, in relevance to our discussion, a person who is persuaded that upon the order of nature, and in particular the scientific order, a transcendent inference may legitimately be founded. In other words, the eutaxiologist, finding mathematical relations, coordinations, adjustments everywhere, concludes that nature's order—"absolutely universal, eternally enduring, and infinitely exact," as Romanes¹ described it—could only have been issued under the seal or stamp of Infinite Intelligence. He does not, with some philosophers, look upon nature's order as an ultimate conception, as an eternal principle like the Platonic Idea ; it must be due, as he believes, to a Mind in which it is conceived, to a Will by which it is in the world made manifest. This, after all, is the gist of the traditional argument from design.

Nor is it unreasonable that the eutaxiologist should be a theist. If the plain man, out of his appreciation of the common order of nature, catches

¹ *Thoughts on Religion*, ed. C. Gore, p. 72.

a glimpse of incomprehensible things and is moved to thoughts of God and of eternity, the man of science, with his deeper appreciation of nature's orderliness and meaning, need not be hesitant to follow him. The man of science is only "the plain man straightened out,"¹ and he may well trust himself to the way that the logic of the heart indicates. That there are many men of science who are unafraid of making the transcendent inference is sufficiently well known, but it is not every one—vigorously and picturesquely as so many of them write—who can express himself like J. Arthur Thomson or D'Arcy W. Thompson. Says the first: "The Logos is at the core of our system, implicit in the nebula, as now in the dewdrop. It slept for the most part through the evolution of plants and coral-like animals, whose dream-smiles are a joy for ever. It slept as the child sleeps before birth. It became more and more awake among higher animals—feeling and knowing and willing. It became articulate in self-conscious Man—and not least in his science."² Says the second: "There is . . . something that is the order of the Cosmos and the Beauty of the World; that lives in all things living, and dwells in the mind and soul of man. . . . You may call it what you please, but it is always the same. You may call it entelechy, you may call it the harmony of the World; you may call it the *élan vital*; you may call it the Breath of Life. Or, you may call it, as it is called in the Story-Book of Creation, and in the hearts of men,—you may call it the Spirit of God."³

Thus it is that simple and wise alike may lift

¹ J. Rickaby, *Studies on God and His Creatures*, 1924, p. 53.

² *The System of Animate Nature*, ii. 637.

³ *Life and Finite Individuality* (two Symposia of the Aristotelian Society), 1918 p. 54; or see *Proceedings of the Aristotelian Society*, 1917-18, p. 461.

their hearts to an order of nature rising above and dominating the empirical orders, to an order which discovers itself, to those who acknowledge it, as the truly real order, making the empirical orders possible.

PART II

THE CONCEPT OF PURPOSE

CHAPTER IX

PURPOSE : THE TERM AND ITS COGNATES

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IN so far as I have dealt with the theistic argument from order, the so-called argument from design, I have necessarily touched upon the great fundamental concept of purpose which I want particularly to consider in these pages. But it is a concept which has entered very much more widely and deeply into the history of thought than theology ordinarily recognises. As the teleological principle, in distinction from the teleological inference, it is found both in metaphysical philosophy and in philosophy of natural science, and a closer study and nearer appreciation of it will serve—to reiterate an opinion already expressed—the important end of the reconciliation of, in the sense of the establishment of a mutual understanding between, science and religion. Whitehead says, in words that are as weighty as they are challenging: “When we consider what religion is for mankind, and what science is, it is no exaggeration to say that the future course of history depends upon the decision of this generation as to the relations between them.”¹ It would be indeed calamitous if no mutual understanding as between those two great influences in life were found to be possible, and the alternative had to be faced, science without religion or religion without science. It looked in the middle of last century as though that were to be the

¹ *Science and the Modern World*, p. 253 ; cf. A. Titius, *Natur und Gott*, p. 1.

issue ; the outlook at the present day is much more hopeful.

The concept of purpose attached itself to that organic view of nature which was developed in the ancient Greek philosophy as against the mechanical view. According to the mechanical view, the whole is the product of the parts by their mutual interaction. According to the organic doctrine, the whole is ideally prior to the parts, and constitutes the explanation of their mechanical actions and reactions. This latter doctrine, which was influential not only in the sphere of natural philosophy but in the sphere of political and social philosophy as well, led to the teleological interpretation of nature as a realm of ends or final causes. As the whole was an unchangeable form, it gave to all movement a purpose and goal ; and in the light of its purpose and goal the movement itself was most deeply interpreted.

This ancient opposition between the mechanical and teleological standpoints, as represented by Democritus and Aristotle respectively, set a problem which runs through the whole history of philosophy. The fundamental question at issue is, Are natural processes subordinate to conscious rational purpose, or is the world to be explained and interpreted by mechanical principles alone ? That is the deeper philosophical issue in its most clear-cut form. It is the issue between theism and naturalism. But there is a narrower issue which has assumed increasing definiteness in modern times. The fundamental question here belongs to scientific method rather than to metaphysics, and is most prominent at the present time in the dispute between mechanism and teleology—understood in a dynamic sense—in biological theory. Are the characteristic problems of biology capable of solution by means of mechanistic categories, or must teleological factors also be postulated ?

While the broader question thus raised—namely, whether the world is to be interpreted theistically or on naturalistic lines—is of high importance for religion, its importance in this respect is apt to be magnified unduly. Suppose it were found impossible to show on philosophical grounds that the world is governed by conscious rational purpose (for example, von Hartmann could only affirm Unconscious Will as the ultimate principle), it does not follow that the theistic faith is an illusion. As already maintained, the theism of natural philosophy or philosophy of nature, which is in this reference natural theology, is one thing, the theism of the moral and religious consciousness another; and we may rest in the latter, even while unpersuaded of the truth or validity of the former.

It may be a disservice to theology to dissociate it, as Ritschl and other modern Protestant theologians have sought to do, from metaphysical or speculative problems, such as are necessarily bound up with a theistic philosophy; on the other hand, this may be said, that it serves to emphasise the fundamental importance of the ethical and spiritual in theistic belief, of the immediate experience as distinguished from the reflective process.

At this stage, before we enter into the discussion of the concept of purpose in relation to the order of nature, it may be well to consider the term “purpose” itself, and also some cognate terms commonly used in such a context; and while considering them, to illustrate their use in the history of thought.

Purpose, as defined by Professors Baldwin and Stout in their *Dictionary of Philosophy and Psychology*, is a project which is adopted for execution but not yet executed. Or, as it may be otherwise put, it is a positive result as ideally represented or in some measure cognized before its achievement.

End—a term also commonly employed in the history of philosophical and theological thought—may be regarded as an equivalent term, that is, where end does not signify a result achieved,¹ but a result ideally represented or in some manner cognized. And further, the result thus represented or cognized must be regarded as an ideal end, as distinguished from a concrete end or purpose, a remote or ultimate, as distinguished from an immediate, or—as we might also say—an intermediate end or purpose. To use the illustration in the Dictionary above-named, if the grocer's ideal, remote, or ultimate end or purpose is to get rich, his concrete or immediate ends or purposes are weighing sugar, buying tea, and collecting bills.

Another term which may be regarded as equivalent to end or purpose is *final cause*, the *causa finalis* of the Schoolmen. It was used by them in contradistinction to efficient cause, the *causa efficiens*, both these terms being derived from the language of Aristotle, in whom the use of the terms, end, purpose, final cause, receives classical illustration.

In the *Physics* Aristotle says that there are four kinds of causes, or necessary conditions of physical change, at work in nature, of which the physicist must take account: (1) the ἐξ οὗ, the "from which," or the material cause; (2) the ἐν ᾧ, the "according to which," or the formal cause; (3) the τὸ ὄθεν, the "by which," "the whence"—or in the phrase of the Schoolmen—the efficient cause; (4) the οὗ ἕνεκα, the "for what," or the τέλος, the "end"—what the Schoolmen named the final cause. A bronze Hermes may supply illustrations from the realm of art of all four causes. The material cause is the bronze of

¹ As when purpose is described as "a plan in mind with end in view" (C. Lloyd Morgan in *The Modern Churchman*, September 1924, p. 291).

which the statue is made ; the formal cause is the form or pattern of the statue in the sculptor's mind ; the efficient cause is the sculptor himself ; and the final cause is the sculptor's end, purpose, or aim. But as the form in the sculptor's mind determines his activities, the efficient cause may be said in this case to coincide with the formal cause ; and as the sculptor's aim is to attain the form which is in his mind, the final cause may also be said in this case to coincide with the formal cause ; so that the four principles above distinguished are reducible to two—matter (ὕλη) and form (μορφή, λόγος, εἶδος), potentiality (δύναμις) and actuality (ἐνέργεια, ἐντελέχεια), matter being always relative to form, potentiality to actuality, as the moved to the mover. And in his philosophy of nature also, Aristotle often identifies form with efficient and with final cause. But in the sequel we shall have occasion to see how profound and far-reaching is the Aristotelian doctrine of the end ; as also how one-sided an interpretation it received in ancient and mediæval Christendom, to the hindrance of the scientific movement.

A note on the word *teleology* might also be useful. It was a word apparently devised by Christian Wolff in 1728. He felt the need of a term to designate the branch of natural philosophy which had to do with ends or final causes as distinct from efficient causes. For him, accordingly, teleology signified the study of ends or final causes in nature, and more precisely the explanation or interpretation of natural phenomena in the light of the concept of end or final cause. In popularising or, rather, codifying Leibniz's philosophy he set explanation based on final cause side by side with explanation by efficient cause. Presumably he derived teleology directly from τέλος, an "end" ; but, as Burnet¹ has

¹ *Greek Philosophy*, pt. i. p. 346 n.

remarked, the word is properly derived in the first instance from τέλειον, "complete." If derived from τέλος, it should have been spelled "telology." Thus, etymologically regarded, it does not bear the implication, which it has historically, of an "external end"; and the prevalent "organic" use of it in modern thought is justified.

Another term cognate to purpose is *design*, which may be defined with Professors Baldwin and Stout as a purpose or end which is more or less remote and for whose attainment the means are more or less clearly understood and within control, and concerning which, moreover, there has been some preliminary deliberation. This term provides, as we have seen, a popular title to the theistic argument from order and position, and its use will be abundantly illustrated in the sequel. But it may be here stated, that a comparison of the definitions of purpose and design will readily show that when the concept is viewed, as in theism, *sub specie æternitatis*, the term "purpose" is to be preferred in designation of it, as not so obviously anthropomorphic, and not requiring to be purged so drastically of adhering limitations and defects. It may be added that in his restatement of the argument from design, which he names the argument *to design or purpose*, R. Flint appears to have used the word "design" in a distinctly different sense from that which it generally bears in the writings of Paley and his school. With them, as Romanes affirms, design means a certain process of thought; with Flint it means rather a product of intelligence—in other words, is synonymous with intention, irrespective of the particular psychological process involved in carrying it out.¹

Yet another term cognate to purpose is worthy of special notice, namely, *plan*. This term enters

¹ *A Candid Examination of Theism*, by "Physicus," 1878, p. 153 n.

chiefly into the history of theological, as distinguished from theistic thought, although—as we shall see—it may be associated with the deistic or anthropomorphic type of theism. A plan is not a purpose, but it is a means of realising a purpose. In other words, a purpose is that for the realisation of which the plan is adopted. In Christian theology the word “plan” has been commonly used in the interpretation of history. The Christian view of history appears to have been developed in opposition to the Gnostic view, which looked upon the Old Testament religion as the revelation of an inferior Deity, the Demiurge or Creator of the universe, who was distinguished from the God of the New Testament. As in the ancient Greek philosophy a teleology of nature was expounded, so in the religious period of the ancient world and within the early Christian Church the idea of a teleology of history gained ground. It fastened upon the Pauline doctrine of the pædagogic function of the Law, which gave to the Law a distinctive place in a teleological series of divine processes; and the course of time was interpreted as the working out of a great plan of redemption which culminated in Jesus Christ. By means of this plan of redemption the universal purpose of the establishment of the Kingdom of God was to be realised. With Irenæus¹ the teleology of nature is ancillary to the teleology of history, as thus viewed from the Christian standpoint. At the hands of Augustine the whole conception receives an impressive treatment, history being regarded as a great drama of which, as J. Neville Figgis phrased it, “the supreme crises are in Eden and Calvary.”² This anthropocentric view of the world as the scene of the divine redemption

¹ *Against Heresies*, iv. 38. 4.

² *The Political Aspects of St. Augustine's "City of God,"* 1921, pp. 35, 36.

which culminated at the Cross of Calvary still prevails in Christian theology, in which the teleological principle of history is sometimes described as Christological or Christocentric. It is in Jesus Christ, in other words, that the whole historical movement, and more especially the whole religious development of mankind, reaches its climax ; and through Him again, as from a great tree-trunk of far-spreading roots, albeit directly nourished in the soil of the religion of Israel, the development proceeds in ramifications rich and various. Upon Jesus Christ, to change the metaphor, the manifold rays of light converge ; from Him again they diverge, to illuminate the whole world.

CHAPTER X

PURPOSE AND THE COMMON OR PUBLIC
ORDER OF NATURE

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I HAVE spoken of the order of nature as threefold : first, the common or public order, evolved by common sense out of the original chaos of sensation, feeling, and endeavour, and represented for the most part in picture and popular symbol ; secondly, the scientific order, the product of logical analysis and synthesis, in which representation is general and abstract in quality—indeed, as some say, the more abstract the better ; and thirdly, the spiritual order, the product of philosophical reflection or religious intuition, in which it is not the outward nor the inward point of view that is taken but the ultimate or the complete point of view, in which more than conscious recognition or intellectual contemplation is involved but also spiritual appreciation, and in which representation is in terms of meaning and value.

First let us consider the concept of purpose in relation to the common or public order. Here we are not primarily concerned with the transcendent inference to divine Purpose ; what concerns us is immanent purpose in the world as recognisable by the average civilised man.

In the ordinary empirical world the quality and operation of purpose are readily discerned. In our human life purposiveness, in the sense of activity directed towards an end, is a fundamental characteristic. Psychology rightly holds that conation or conative activity has been deep-set in human

experience from the beginning. Indeed, there is much to be said for the psychological position that action or volition is the primary and central factor in man's evolution, and cognition only a derived product of action. In any case, conative activity is undoubtedly a central current, steady, strong, and deep, in the life of the race; and in the course of the ages, it has gained in definiteness and direction, so that we are now ready to say that men are not only more or less consciously actuated by purpose, but consciously seek to realise ideal ends. Such ends may be high or low in the ethical scale, but the point is that they are definite goals of desire and effort.

“ That low man seeks a little thing to do,
 Sees it and does it;
 This high man, with a great thing to pursue,
 Dies ere he knows it.”

And I suppose they are the great men who are the most conscious of large purposes and aims and the most single-minded in pursuit of them—“one thing I do.”

It would be tempting to discuss the secret of strong purpose and of the fulfilment of it. Benjamin Kidd finds it in “the emotion of the ideal.” He is of opinion that power in civilisation and the passion for the ideal go hand in hand. “Every deep-seeing mind of the race—from the founders of its first religions, from Plato in his groping after the meaning of the soul in the *Phædrus*, from the prophets of Hebraism and the leaders of Christianity down to the seers of the current age—has felt the illimitable significance of the emotion of the ideal in the development of the world.”¹

But our theme is not the secret of purpose and power. It is the existence of conscious rational purpose in human life. And I go on to affirm that

¹ *The Science of Power*, 1919, p. 149.

the presence of large and strong purpose in human life makes for that unification and integration of personality which is the consummation of individual life and being. I must be content simply to affirm this, and to add that this is why purpose is so important a concept. It affords a clue not only to the beginnings of human life and its development, but also to the secret of its best and highest fruition, namely, in personality unified and integrated.

Now the concept of purpose, which comes to us from the consideration of human life and activity, may be carried by analogy both upward and downward, so to speak. To carry it upward is to predicate it of Deity; to carry it downward is to predicate it of the infra-human. It is with the concept in its downward reference or application that we shall deal in the first instance.¹

“From the grand result
A supplementary reflex of light
Illustrates all the inferior grades, explains
Each back step in the circle.”

Let us begin by noticing that it has been suggested that, lest we should be misled by the principle of analogy and read into the term “purpose” more of meaning than it can always bear, we should speak of purpose in relation to conscious rational human activity as purposefulness, and all semblance of purpose at the infra-conscious or even the non-conscious stage of existence we should characterise as purposiveness. Arthur Thomson accepts this proposal as to use of terms, and in an interesting analysis distinguishes “conceptual purposefulness in man’s conduct, perceptual purposefulness in the intelligent behaviour of man and some animals, instinctive

¹ For an exposition of the objective marks of purpose, see W. McDougall, *Outline of Psychology*, 1923, c. ii.

purposiveness in the routine behaviour of ants and bees, and organic purposiveness in the controlled and experimental endeavours of brainless animals.”¹ It should be observed that these various forms of purpose may be distinguished without crossing the boundary line, however ill-defined, that separates the common or public order of nature, to which we are now more or less restricting ourselves, from the scientific order.

Conceptual purposefulness in man's conduct has already been before us, as manifested at the self-conscious stage of human existence. But human purposefulness may operate as a lower form of experience, when the end is a perceived or proximately real end in contradistinction from a conceived or ideal end. St. Paul's "one thing I do" was his pressing toward the mark for the prize of the high calling of God in Christ Jesus—a conceived or ideal end. On the other hand, we may readily think of quite literal forms of pressing toward the mark, *e.g.* on the racecourse or the football field, where the end, however much it may minister to the ideal, is a perceived or proximately real end.

Perceptual purposefulness may also be discerned in the intelligent behaviour of animals of the big-brain type, like the dog, the horse, or the elephant, who appear to possess the capacity of anticipating a desired and perceived end. Perhaps it plays a larger rôle in the animal world generally than we are inclined to think. "When rooks take freshwater mussels to a great height and let them fall on the shingle beneath, so that they are broken; when a mother weasel, accompanied by one of her offspring, about to be overtaken on the links, seizes the youngster in her mouth, dashes on ahead, and lays it in a sandy hole; when beavers cut a canal right

¹ *The System of Animate Nature*, i. 340.

through a large island in a river ; . . . we say, with probable accuracy, that the creature was actuated by a definite purpose.”¹

Passing farther down the scale of nature, we may also discern a semblance at least of conscious rational purpose in the behaviour of certain lower animals of the small-brain type, like the ant, the bee, and the wasp. Here, however, we may no longer speak of purposefulness even in the perceptual sense. We appear to have reached an infra-conscious stage of existence, in which behaviour seemingly purposeful is no more than an instinct of routine. It may fitly be named the stage of instinctive purposiveness.

Passing yet farther down the scale, we may also discern a semblance of conscious rational purpose, such as we know and recognise in our human life, in the life of brainless organisms, like the starfish and the sea-urchin, whose behaviour may be obviously in some measure selective, making at once for self-preservation and racial continuity. Indeed, the biological organism in general, whether of plant or animal, presents in its life and activities an indubitable semblance of purpose, and we may legitimately speak of it as showing organic or organised purposiveness.

When, leaving the stage of the organic, we pass still farther down the scale of nature to the stage of the inorganic, the semblance of purpose meets us no more. There are no individual beings in inorganic nature, to the eyes of sight at any rate (and it is only the eyes of sight that we are for the moment seeking to use, it is only the common or public order of nature we are interrogating²), and where there are no individual beings, there is no suggestion of resident operative purpose. For we need not indulge the

¹ J. Arthur Thomson, *op. cit.*, i. 335.

² It may be said that to study the movements of crystals is to interrogate the scientific order.

poets' fancy, and look upon inanimate nature, the air, a rock, the sea, as responsive to our varying moods and thus as so far evidencing meaning and purpose. The poets themselves would correct the "pathetic fallacy":¹

" O Lady ! we receive but what we give,
And in our life alone does Nature live :
Ours is her wedding garment, ours her shroud ! "

But if purpose may not be discerned as resident and operative in the world of inorganic nature, it is recognisable, in semblance, in products of art and man's device composed of inorganic elements. Has it not often seemed to us, as we have stood by some powerful engine in a works or factory, as though the revolving wheels, and the machinery as a whole, were alive with a secret energy of passion and purpose? It was a similar fancy that Samuel Butler worked out in his famous satire of *Erewhon*, in which the machines of man's contrivance are represented as having wills of their own and as revolting against man's domination. The purposiveness does not, however, actually reside in the parts of the machine, but in the processes they subserve. A machine, as Driesch says, is distinguished from other human "artefacts" as being made for processes. It is, as it were, the depository of a purpose. But the purpose emanates in the first instance from some human brain. That is why the comparison of the world to a machine in the old natural theology, as by Cleanthes in Hume's *Dialogues*, is apt enough, especially when the Deity is deistically conceived as purely transcendent. The Deity deposits His purpose in the machine, then sets the machinery agoing. But it is also the reason why the comparison of the world to a machine is

¹ Cf. J. Ruskin, *Modern Painters*, pt. iv. c. xii.

inept from the standpoint of materialism or of naturalism, and why from such a standpoint mechanism as applied to the world, as in the merely mechanistic view of physico-chemical, biological, and even psychological processes, is not a particularly happy phrase. Behind mechanism there is always the contriving brain. As Canon Streeter has recently said, "If Theism is anthropomorphism, Materialism is mechanomorphism, an attempt to fashion the Infinite in the image of a machine."¹

From our examination, then, of the concept of purpose in relation to the common order of nature, we find that conscious rational purpose is manifest in our human life, where indeed it is of central significance, and that when we carry the concept of purpose downward into the sub-human world we find, if not purposefulness, then purposiveness everywhere, except in the domain of the inanimate or inorganic. When we examine the concept in relation to the scientific order of nature, we shall get a larger, deeper, and more intimate view. Meantime it is something to have gained the impression of purposive activity everywhere in the realm of organisms, whether human or sub-human. And this suggests at any rate the position that Mind or Purpose is not only at the making of our world (a position which, as we have already seen, may be sufficiently based on the immediate impression of the natural order derived by common sense) but belongs to the immanental ground of reality. The position is strengthened when we consider the suggestions of Mind or Purpose yielded by the scientific order, even if natural science itself is as such hesitant to speak of purpose, viewed even as a principle or instrument of knowledge not necessarily correspondent to or interpretative of reality.

¹ *Reality*, 1926, p. 9.

CHAPTER XI

PURPOSE AND THE SCIENTIFIC ORDER:

1. THE TELEOLOGICAL JUDGMENT

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WHEN we turn to the consideration of the concept of purpose in relation to the scientific order of nature, we pass from purpose as a principle of description in the natural world to purpose as a principle of explanation—that is, following the distinction which might be drawn, as I suggested, between the representations of the common order and those of the scientific order as descriptive and explanatory respectively.

Let us notice at the outset that when the concept of purpose or end is employed in scientific exposition, it is not necessarily to be understood as possessing its face-value, as when it is descriptive of human and even sub-human life and activity, not to say its pre-eminent significance, when carried up by the principle of analogy into the sphere of the Supreme Mind and Will. Teleology in scientific exposition may be at best no more than a methodical principle, that is, a principle belonging to scientific method. In Kantian terms it may be only regulative and not constitutive of knowledge.¹

Kant said that except we make use of the notion of purpose or end—a notion which has its proper sphere in the world of spirit, in the supersensible world of values—we cannot attain to the knowledge of living things, that is, we cannot describe or explain

¹ According to Kant, a principle of knowledge is no more than regulative if the element of intuition is inadequate to the “idea.”

them adequately. On the other hand, he said that the notion of purpose or end as applied to the realm of nature—and in this he was consistent enough with his critical philosophy—cannot be affirmed as possessing objective validity. It effects no real transcendence of the dualism between the worlds of fact and of value. When properly understood, it is employed, not as an objective principle, constitutive of objects, but as a subjective or regulative principle, serving as a rule or guide for the organisation of experience and the further extension of knowledge. It is an indispensable organon or instrument in the investigation of the world of organic life, but it does not follow that it enters, as it were, into the meta-physical tissue of reality.

This Kantian distinction has been so influential upon recent thought that I ought perhaps to dwell longer upon it, with closer reference to Kant's own statement of it.

It is in the *Critique of Judgment* (1790) that Kant thus formally, if not really, overcomes the dualism between facts and values. In the *Critique of Pure Reason* (1781) he had justified, as against Hume's scepticism, the mechanical or scientific view of nature as subject to causal determination. In the *Critique of Practical Reason* (1788) he had vindicated the teleological view of the spiritual life as a realm of moral freedom and independence. From the critical standpoint, therefore, the doctrine of nature and the doctrine of morality may each be true in its own sphere, and mechanism and teleology be so far reconciled. Yet, even so, nature and the moral order remained closed systems, independent of and separate from each other. It was to bridge the gulf between the sensible world of things and persons and the supersensible world of moral values, so far as this was possible on his critical presuppositions, that

Kant drew attention in the *Critique of Judgment* to certain aspects of the sensible world of nature which we cannot describe or explain adequately without that notion of purpose or end which properly belongs to the spiritual world. One of these is the phenomenon of beauty, the other—as already indicated—that of organic being.

The first section of the *Critique* treats accordingly of the æsthetic judgment. In the æsthetic experience the beauty of nature, as of art, is felt to be purposive, in the sense that, while it arises out of the sensible, it is in harmony with our “undefined idea” of the supersensible. The second section has to do with the teleological judgment, in which nature is regarded as purposive in itself, and not merely, as in the æsthetic judgment, in relation to the subject of experience.

The purposive character of living beings raises anew for Kant the whole problem of the world as a teleological or organic system, and he now gives the notion of judgment a wider meaning than before. In its use of the principles of the understanding for the subsumption of the particular under the general (in which the faculty of judgment consists), judgment had been shown in the first *Critique* to be determinant, or, as we might say, mechanical; that is, its function is to determine or specify the phenomenal world of experience as a mechanical system under inviolable principles. But judgment is also of another kind, namely, reflective. In subsuming the particular under the universal, reflective judgment makes use of the idea of subordination to purpose or end as the guide to its operations. The determinant judgment is analytical, and simply brings particular facts under the universal principles of the understanding. The reflective judgment is synthetical, and, operating with the idea of nature as a teleological or organic

unity, discovers its specific laws. As Windelband¹ remarks, in this application of the category of the practical reason to the object of the theoretical, we have evidently the highest synthesis of the critical philosophy.

But still there is no real transcendence of the dualism between the realm of nature and the realm of ends, between the factual world of experience and the ideal world of purpose and meaning. For the principle on which reflective judgment proceeds, that the form of nature implies purpose, that the specific laws of nature are to be regarded as though determined by purposive intelligence, is not constitutive of objects. Transcendental though it be, as involving an *a priori* synthetic judgment, it remains a subjective or regulative principle, serving as a rule or guide for the organisation of experience and the further extension of knowledge. Without the conception of end or a purpose of reason as realised in the form of organised beings, we could not indeed make such beings intelligible to ourselves. Even a simple blade of grass remains inexplicable unless we look upon it as purposive.

The conception of the organism as purposive leads, moreover, to the view of collective nature as an organic whole, or teleological unity. But it should be reiterated that we cannot affirm the principle of end or final cause as belonging to the essential constitution of nature. Could we penetrate to nature's hidden ground, we should possibly discover that the principles of mechanical and teleological causation are assimilated in one single principle. The very limitation of our knowledge suggests to us the idea of a higher intelligence, possessed of knowledge which is direct and not mediated by a subjective principle. For such an intuitive or perceptive understanding

¹ *A History of Philosophy*, E.T., 1893, p. 561.

there would be no such separation as our discursive understanding makes between means and end. As it is, the mechanical and teleological principles are at once complementary and heterogeneous, though the teleological is the final or inclusive principle.¹

In the course of his examination of the critical philosophy, Hegel maintained that the critique of the teleological judgment was vitiated by the view of the phenomenal and the noumenal as abstract opposites, but that it none the less indicated, if indirectly, the true principle of cosmic interpretation. It was impossible to distinguish, with Kant, the categories of mechanical and teleological causation as being constitutive and regulative, objective and subjective respectively. With his true apprehension of the idea of purpose as internal and immanent, Kant, but for his rationalistic prejudices, might have advanced to the recognition of the constitutive character of the organic or teleological principle. Internal adaptation of means to end is no less constitutive of knowledge than the principle of mechanical causation. To overcome the opposition of phenomena and noumena we must, as Hegel added, follow the development of the world from the realm of nature to the realm of mind and thence to the unity of nature and mind in the Idea of God, in whom the world is seen to be a rational system.

But we must not at this stage enter further into the question of ideal or ultimate teleology. As it is only a formal or descriptive teleology that is given us in the common order of nature, so it may be no more than a logical or methodical teleology that is given us in the scientific order. At any rate, so strongly has the Kantian distinction between purpose as regulative and purpose as constitutive impressed itself, whether

¹ Cf. A. S. Pringle-Pattison, *The Idea of God in the Light of Recent Philosophy*², 1920, p. 330.

directly or indirectly, upon subsequent thought that many philosophers of science at the present day, while not necessarily committing themselves to the general Kantian position, but leaving the question of objective validity open, regard the concept of end or purpose which they find it needful to adopt in their scientific formulations as only an allowable hypothesis, a heuristic principle, a methodical or methodological postulate, without which, however, they would be at a loss to make their formulations adequate.

It may be justly said that Kant promoted, indirectly rather than directly, the organic view of nature upheld in the new German humanism by the so-called philosophers of nature, of whom Schelling was a leader. It was felt that in the Kantian philosophy, as J. T. Merz¹ puts it, the details of the scenery of nature were forgotten in the interest of studying the attitude of the beholder. Accordingly there was a revival of the ancient conception of a world-soul which, as an inner principle of life, united all differences in nature in a single organic or teleological system. There was also a recrudescence, under the humanistic movement, of vitalistic theories in biology (which term was first used in this period by Treviranus to cover the whole of the science of life). Though the biological implications of the *Critique of Judgment* are difficult to grasp, vitalism could readily appeal to Kant's philosophical authority against the mechanical theory of life. For, while Kant handed over the inorganic realm to the mechanical theory (in this only sanctioning a *fait accompli*), he had maintained along with the teleological unity of nature as a whole the Aristotelian concept of biological organisation. So at least it

¹ *History of European Thought in the Nineteenth Century*, 4 vols., 1896-1914, iii. 552.

was generally thought, despite the metaphysical distinction he drew between the determinant and the reflective or teleological judgment as constitutive and regulative respectively. It is a distinction, it should be remarked, which science cannot but ignore; when science employs teleological concepts such as function or adaptation, it gives them the same validity as it gives to the concept of mechanical causation.¹ But the humanistic movement soon lost its force, and the vitalistic theories which had received their impulse from it, and which culminated in Johannes Müller, fell into comparative neglect, and the mechanical view of life was once more dominant. The most solid, according to H. Driesch,² of all the attacks upon the older vitalism was made by Lotze, whom he describes as a static teleologist in physiology, in that he believed in the irreducibility of the category of the organism, although a dynamic teleologist or vitalist in psychology, in that he believed the soul to be productive of absolutely new mechanical movement. The distinction between static and dynamic teleology will be before us later.

¹ L. J. Henderson, *The Order of Nature*, 1917, p. 67.

² *The History and Theory of Vitalism*, 1914, pp. 127-132.

CHAPTER XII

PURPOSE AND THE SCIENTIFIC ORDER :

2. THE SPHERE OF INORGANIC NATURE

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TURN now to the consideration of the place of the concept of purpose, as methodically or methodologically conceived, in the scientific order of nature.

We have noticed ¹ that there are two general standpoints from which we may deal scientifically with the realm of nature, namely, the standpoints of the *How* and the *What*. We may inquire how things come to be what they are ; and we may also inquire what is actually there, and more particularly what is actually taking place. The first is the genetic point of view, the second may be called the systematic point of view. The first is the point of view of cosmogony (using the term broadly), the second of cosmography (again using the term broadly). In the first case the world is viewed in the temporal reference, in the second case in the spatial reference ; or, as we should rather say, in the first case temporal relations bulk the more largely, in the second case spatial relations.

Let us, in considering the concept of purpose in both references or relations, begin with the sphere of inorganic nature.

In this sphere there appears to be no need of the concept of purpose in genetic explanation—taking the genetic point of view first. Just as we found that the concept is irrelevant in the pictorial descriptions of inorganic nature supplied by common sense,

¹ P. 120.

so it is also irrelevant in the logical explanations supplied by genetic science. The development of the inorganic world down the long vistas of time cannot be said to exhibit immanent or resident purposiveness. In setting forth the genesis of the inorganic world science assumes the operation of the non-spontaneous, the automatic, the mechanistic alone, employing in its formulations only the mechanistic terms of kinematics, mechanics, physics, and chemistry ; and it has amply vindicated its right to do so in this reference. Whether it may also do so in the spheres of biology, psychology, and sociology is another question. But in cosmogony (reverting once again to the customary narrower sense of the term) there is no need of the category of end, purpose, final cause. Given the nebula, our physical universe may be shown to be deducible from it by the operation of mechanical and physico-chemical principles alone. This is the truth which Laplace seems to have grasped, and to have expressed in his famous answer to Napoleon.¹

In cosmography also, in the systematic description of inorganic nature in the logical and abstract terms of physical science, the mechanistic view may be allowed to be all-sufficing, even as it is in the more unstudied descriptions of common sense. When we interrogate the physical universe as it environs us to-day, a field of orderly dispositions and activities, we need have no recourse for the purposes of science to any principle of description or explanation other than or beyond the mechanistic.

But while this is said, there appears to be an ultimate problem of order in the physical universe which does not yield to the mechanistic explanation. The problem is constituted by the fact that there is not so much a primitive disposition or collocation of

¹ See p. 102.

matter (which provides the cosmogonic form of the old argument from design) as a primitive disposition or collocation of properties of matter.

A reference at this point to the place of the collocations of matter in theistic apology may well lead up to this newer idea of a collocation of properties.

It was undoubtedly tempting for the old natural theology of the Bridgewater Treatises to revive, as Chalmers actually did, the Cartesian distinction between the laws of matter and its dispositions or collocations, and to say it is in the dispositions more than in the laws that the main strength of the argument for a Divinity lies. The revival of this distinction did indeed strengthen the case for physico-theology, with its pre-evolutionary science, as being a reminder that the physical universe is something more than the scene of operation of laws of matter. As Chalmers puts it, with reference to the faculty of vision, "The laws indispensable to this result are greatly outnumbered by the dispositions which are indispensable to it—such as the rightly sized and shaped lenses of the eye; and the rightly placed retina spread out behind them, and at the precise distance where the indispensable picture of external nature might be formed, and presented as it were for the information of the occupier within; and then, the variety and proper situation of the numerous muscles, each entrusted with an important function, and all of them contributing to the power and perfection of this curious and manifoldly complicated organ."¹ But when Chalmers goes on to say, "It is not so much the endowment of matter with certain properties, as the arrangement of it into certain parts, that bespeaks here the hand of an artist," then he places his argument in jeopardy. "What would become," asks James Ward, "of this

¹ Bridgewater Treatise, Introductory Chapter.

' main evidence for a Divinity ' if the laws of matter themselves explained its collocations? " ¹ And, undoubtedly, since Chalmers' day science has been steadily gathering the collocations within the mechanism of nature, and explaining them genetically by the laws of nature's uniformity. Thus, as the event has shown, it was a weakening instead of a strengthening of the theistic argument to exalt the second element in the Cartesian distinction, the arrangements or configurations of matter, over the first element, the laws of matter.

None the less the problem of order and disposition still remains. If the forms and states and quantities of matter and energy in the nebula determine the resulting solar system ² (and I suppose we should be content if we could trace things and events backwards to the nebula which became the solar system), what determines the forms and states and quantities of matter and energy in the nebula? Here is a problem which science as such cannot discuss, much less solve.

But further, it appears from recent physico-chemical investigations—and this is the point to which I have been leading up—that besides an ultimate configuration or collocation of matter there is also an ultimate collocation of properties of matter.

The distinction between collocations of matter and collocations of properties of matter should be clearly recognised. The first reminds us of the orderliness of the universe as composed of matter subject to natural law, the other of the diversity of the universe, as composed of material elements containing radically different properties. Both together, the collocations of matter and the collocations of properties, enter into any complete account

¹ *Naturalism and Agnosticism*², 1906, i. 47.

² Cf. L. J. Henderson, *Fitness of the Environment*, p. 301.

of the universe ; and both together, the orderliness and the diversity of the universe, appear to be necessary to the evolutionary advance.

Now the properties of the elements, hydrogen, carbon, and oxygen, and of their compounds, water and carbon dioxide, which have been the chief factors in both geological and biological evolution, have been investigated by Lawrence Henderson, who finds that they constitute a unique group of singular physical and chemical characteristics, so that they are *maxima* or the fittest possible for organic life. For example—to take first the elements—hydrogen, carbon, and oxygen form the greatest number and variety of chemical compounds, and enter into the greatest number of chemical reactions, involving the greatest transformations of energy known to the chemist, thus making for that diversity of the universe of which I have spoken, and on the necessity of which for evolution Herbert Spencer laid so much stress. Or again, the solvent action of water—to take one of the compounds—is the greatest of solvent actions, so that it can dissolve more substances in greater concentration than any other liquid ; and the latent heat of vaporisation of water is the highest known latent heat of vaporisation, so that it offers more resistance to the extremes of heat and cold than any other liquid. Or again—to take the other compound—the solubility of carbon dioxide in water is such that it must always be evenly distributed between the atmosphere and aqueous liquids, so that it cannot be wholly washed out of the air or wholly extracted from the waters of the globe.

Moreover, it is Henderson's opinion that, as according to the law of probabilities the connection between the properties and the process of evolution cannot be due to mere contingency, the properties

can only be regarded as a preparation for the process, or, in other words, as resembling adaptation to an end—the end, namely, of providing a suitable home and habitation for organic life. There is a fitness of the environment for life as well as a fitness of life for the environment ; there is adaptation, or what looks like adaptation, of the environment to life as well as adaptation of life to the environment. Or, to put it otherwise, there must be a functional relationship, something like that known to physiology, between the properties and the process, and it must be described as teleological. How else can we express the fact that the collocation of properties unaccountably precedes that to which they are unquestionably related ? Just as biological organisation is teleological and non-mechanical, so with the connection between the properties of hydrogen, carbon, and oxygen and the evolutionary process. This is a result which offers a positive contribution towards the vast problem of the contingent, or the collocation of things in space, set for natural science by Lotze and Lachelier, and which goes to strengthen the theoretical position that mechanism and teleology (even in more than the vague methodological sense) are both at the foundation of the natural order.¹

Of Lotze's position I shall speak later, but a note here on Lachelier might be useful. Lachelier, following Cournot, took up into his philosophy the old distinction between nature passively conceived (*natura naturata*, nature begotten) and nature hypostatized or taken actively (*natura naturans*, nature begetting). The possibility of inductive reasoning rests, as he says, on the recognition of both these aspects of nature, which are complementary.

¹ Cf. *Fitness of the Environment ; Order of Nature ; Philosophical Review*, vol. xxv. No. 3, 1916 ; *Journal of Philosophy, Psychology, and Scientific Methods*, vol. xiii. No. 12, 1916.

From the one standpoint nature is a mechanical or serial unity in which the antecedent determines the consequent; from the other it is a teleological system, or harmonious unity, in which the whole determines the existence of the parts. Efficient causes and final causes are both needed in the inductive process. Nature is at once a science, for ever producing effects from causes, and an art, for ever setting about new inventions. As there is a principle of regularity in nature, so there is a principle also of harmony or order. The contrast of mechanism with teleology is, as Bosanquet has expressed it, "rooted in the very nature of totality."¹

Here I feel I must once more enter the *caveat* which I entered at the outset of this discussion of the place of the concept of purpose in the scientific order of nature. We must not jump to the conclusion that because a scientific writer speaks of preparation and fitness, of the semblance at least of adaptation, and of a functional or teleological relationship, that he would subscribe to the theistic argument from design. A transcendent idea like that of design or purpose is beyond the universe of discourse of the natural scientist as such. (Indeed, it would be regarded by scientists who had committed themselves to a materialistic or naturalistic world-view as, in Mach's phrase, tinctured with "fetishism."²) It is true that the scientist may employ the concept of purpose in his formulations, but he employs it—to cite again the Kantian distinction—as a subjective or regulative and not necessarily as a constitutive principle of knowledge. Even so, he is inclined to regard purpose as too significant, too full-blooded, a term in the context of natural science; and he would express the

¹ *The Principle of Individuality and Value*, 1912, p. 155.

² *Popular Scientific Lectures*³, E.T., p. 253; cf. also *The Science of Mechanics*², E.T., 1902, p. 463.

concept of purpose, even as a regulative or methodological principle, by the vaguer term "teleology." The term "harmony" might do, but it would not be so appropriate. Even the term *Zweckmässigkeit*, usually translated "purposiveness," conveys too much in the opinion of some scientists, being suggestive at least of conscious purpose, external or separable. In seeking a term which would carry the idea of *Zweckmässigkeit ohne Zweck*, "purposiveness without external or separable purpose," von Baer hit upon *Zielstrebigkeit*, "a tendency toward ends"; and this is what teleology means for him. Henderson would say that preparation, fitness, adaptation, if used as teleological terms, are appropriate to the inorganic world; but he would not say, at least as a scientist, that the preparation, fitness, adaptation he finds in the inorganic world is the result of design or purpose. Indeed, it seems to me that he is entirely out of sympathy with the effort of natural theology, whether old or new, being of opinion that when we have laid bare the order of nature we have arrived at one of the "natural frontiers" of thought, "where clear ideas and close reasoning are no longer possible."¹ One may, however, allow this, and yet feel compellingly drawn to make the great venture of theistic faith.

¹ *Order of Nature*, p. 209.

CHAPTER XIII

PURPOSE AND THE SCIENTIFIC ORDER :

3. THE SPHERE OF ORGANIC NATURE

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WE have seen, then, that the concept of purpose is irrelevant in the domain of inorganic nature, when considered as an object of scientific explanation. Mechanistic explanations in terms of kinematics, mechanics, physics, and chemistry are sufficient. On the other hand, we have seen that the problem of the order of nature appears in at least two respects to lie beyond the province of mechanical explanation, whether the problem be viewed in respect of that ultimate disposition or configuration of matter which physical science must postulate, or in respect of those permanent properties of matter, at any rate of hydrogen, carbon, oxygen, and their compounds, which are suggestive—to say no more—of the idea of adaptation to organic life.

A. GENETIC.—Coming now from the realm of inorganic to that of organic nature, we find the two great problems of the genetic and the systematic, of the How and the What, confronting us once more. Let us, as before, take the genetic problem first, and let us inquire what place, if any, the concept of purpose may hold in the sphere of organic nature, scientifically viewed from the standpoint of organic evolution.

The theory of organic evolution, though more deeply rooted in ancient thought than the nebular theory of inorganic evolution, is, like it, chiefly a development of modern thought and investigation.

Here for the pioneer names of Kant and Laplace we may substitute the names of Lamarck and Charles Darwin.

Here, again, the mechanistic hypothesis meets us, and we are asked, in the name of mechanism, to dispense with the notion of end or purpose, even as an instrument in scientific method. The Darwinian principle of natural selection,¹ or the preservation of favoured races, is indeed strongly suggestive of purpose, as is also the complementary principle of the struggle for existence and survival of the fittest, but we must not be misled by the terms in which the principle is expressed. It must be recognised that selection, struggle, and fitness are, in Darwin's use of them, pictorial terms; they do not really involve the notion of guidance towards an end. Recognising this, James Ward, borrowing a "plain" term from Herbert Spencer, describes the Darwinian principle as the principle of "equilibration,"² a term which belongs to the language of mechanism: "Neither struggle for life, nor selection by nature, nor survival of the best, but simply conservation of the stablest; as in a mass of chemical elements capable of combining, compositions, double decompositions, neutralisations, expulsions go on, stronger affinities and avidities overcoming weaker, till the stablest and most permanent combinations are reached."³ Clearly, if natural selection is the sole operative principle in the evolution of species, the theory of organic evolution has no use for the category of end or purpose.

But, while natural selection becomes in the hands

¹ "I have called this principle, by which each slight variation, if useful, is preserved, by the term of Natural Selection" (*The Origin of Species*, c. iii.).

² *Naturalism and Agnosticism*, i. 275; cf. also *The Realm of Ends*, 1911, p. 101.

³ In Herbert Spencer "equilibration" makes for dissolution, "the unhappy epilogue of evolution" (W. Durant, *Story of Philosophy*, 1926, p. 400).

of ultra-Darwinians an exclusive explanation of the modification and transformation of species, and as such radically opposed to the concept of purpose even when viewed only as a methodical instrument, Darwin himself did not urge natural selection as an exclusive principle. He recognised in organic evolution other factors besides natural selection, both non-teleological and teleological. For example, in the last edition of the *Origin of Species* he makes a point of saying that natural selection is "aided in an important manner by the inherited effects of the use and disuse of parts."¹ Whether this, the Lamarckian factor (the spontaneous adaptation or purposive response of the organism to its environment), is a real or a supposititious factor in evolution, is a point with which we are not here concerned, but it may well be that the psychical principles of self-conservation and subjective or hedonic selection, which are teleological, and on which Ward would lay stress, are required to give natural selection a *point d'appui*.² The principle of self-conservation carries with it its own meaning. The principle of subjective selection means that the individual singles out for itself a special environment belonging to the common general environment. So far, as Ward says, there is not necessarily any competition: "Two artists or two anglers may be in each other's way, but an artist and an angler will hardly incommode each other. A garden would still interest a flycatcher if there were neither pease nor cherries in it, provided the insects remained; whereas the bullfinch would at once forsake it. Natural selection as distinct from subjective selection comes into play only when two anglers contend for the same fish, two artists compete for the same prizes, when the early bird gets the worm that the later one must

¹ P. 421.² *Naturalism and Agnosticism*, i. 290 f.

go without.”¹ Our point, then, is that subjective selection, which, like self-conservation, may well be a factor in the evolutionary explanation of species, is favourable to the concept of immanent end or purpose. And it might be added that the anti-Darwinian theories of evolution are more favourable to the concept of immanent end or purpose than the Darwinian and ultra-Darwinian theories; also that Darwin’s general theory of organic evolution, like the general cosmogonic theory of Kant and Laplace, is being increasingly recognised alike by scientists and theistic writers as not necessarily inconsistent with the idea of divine Purpose. Thus C. Lloyd Morgan, a biologist, looks upon divine Purpose as manifested in “the whole sweep of evolutionary advance”;² and James Ward, a spiritual philosopher, says: “Unless the cosmos itself is to be regarded as a finite and fortuitous variation persisting in an illimitable chaos, we must refer its orderliness and meaning to an indwelling, informing Life and Mind.”³

It is a searching test of the sufficiency of mechanistic explanation that Bergson in the rôle of biologist proposed; and it will be instructive to cite Bergson’s test in view of our previous citation of Chalmers, whose anti-mechanistic argumentation rested upon pre-evolutionary science. If it could be proved, says Bergson, that life may manufacture the like apparatus, by unlike means, on divergent lines of evolution, then pure mechanism would be refutable and finality or purpose in a certain sense so far demonstrable. Accordingly, he examined the evolutionary hypothesis in the two forms of it that had emerged from the welter of biological controversy

¹ *Naturalism and Agnosticism*, i. 295, 296.

² In *Evolution in the Light of Modern Knowledge*, 1925, p. 162.

³ *Op. cit.*, i. 302.

since Darwin's time. To neo-Darwinian and neo-Lamarckian alike he puts it, What is the explanation of the structural analogy between the eye of a vertebrate and that of a mollusc like the common pecten ? ¹

On neo-Darwinian principles, which enter readily into a mechanistic philosophy of life, it seems impossible to account for the production of the same effect by two different accumulations of an enormous number of small causes, whether the possibility be urged as by the stricter Darwinists on the theory of insensible accidental variations, or as by de Vries ² on the theory of sudden and simultaneous variations, or as by Eimer ³ on the theory that assigns a direct rather than indirect influence to the environment, explaining the evolution of the various organs by a kind of mechanical composition of the external with the internal forces. To explain the convergence of effects we must appeal, continues Bergson, to some inner directing principle. Here Bergson's sympathy at least with the neo-vitalism of Driesch and Reinke appears, though he is more interested in their critical work than in their constructions. Turning to neo-Lamarckism, which explains variations—the small causes already mentioned—not as accidental or determined, as in neo-Darwinism, but as springing from the effort of the living being to adapt itself to the environment, he declares it to be the only form of the later evolutionism capable of admitting, as it actually does with Cope, ⁴ an internal principle, an inner directing principle, of development. But he cannot allow that an organ such as the eye can be evolved on neo-Lamarckian principles. He agrees

¹ *L'Évolution créatrice*, 1907, E.T., 1911, p. 66 ff.

² *Die Mutationstheorie*, 1901–3.

³ *Orthogenesis der Schmetterlinge*, 1897.

⁴ *The Origin of the Fittest*, 1887 ; *The Primary Factors of Organic Evolution*, 1896.

with Weismann¹ that hereditary transmission of acquired characters or characteristics is the exception and not the rule. Is not the organic effort, he asks, a deeper and more psychological thing than any neo-Lamarckian supposes?

So Bergson is brought round again to his speculative theory of life. He finds the fundamental cause of variations that accumulate and create new species in the transmission of the *élan vital* from one generation of germs to the next, the transmission being through the developed organisms which bridge the interval between the generations of germs. Life does not proceed by association and addition, which is the anthropomorphic fallacy both of mechanism and finalism; it proceeds by the dissociation and division of elements. It must start, no doubt, with a direction or tendency, and is in this sense finalistic or subject to purpose; but we cannot foretell how and where it will end. Each individual in the organised world retains only a certain impetus from the universal vital impulsion, and tends to use it in its own interest. In this adaptation consists. Harmony is revealed only in the mass, in tendencies rather than states; and it is behind rather than before (here Bergson diverges most from finalism), being due to an identity of impulsion rather than a common aspiration, as in Leibniz's theory. Thus what is determinative in the course of creative evolution is not an end or final cause, but the unity of the original impetus. The unity remains, but the gates of the future remain open.

It is instructive to notice that with Bergson the scientific explanation, whether on mechanistic or finalistic lines, requires to be supplemented by speculative theory. After all, the dispute between

¹ *Aufsätze über Vererbung*, 1892; *Vorträge über Descendenztheorie*, 1902.

mechanism and teleology is properly maintained on the scientific plane, not the metaphysical. Nor does it deeply concern religion. Believing that divine Purpose is being realised in organic evolution, the religious man may well be content to leave it, as in fact he must, to the scientific theorists to discuss in what sense and to what extent there are traces in the universe of the operation of immanent or resident purposiveness.

B. SYSTEMATIC.—Coming now to the systematic problem confronting the investigation of organic nature, we notice that the mechanistic view still claims our allegiance. Popularly or pictorially considered, as we have already seen, the sphere of organic nature exhibits resident operative purposiveness, whether organised or instinctive, which rises to perceptual purposefulness in the case of higher animals, conceptual purposefulness being exhibited only when we pass out of the realm of organisms into the realm of man. But it is a nearer view of the realm of organisms that we take in the scientific approach. The psychology or behaviour of organisms, animal or plant, discovers itself—speaking generally—to common observation; the more intimate organic laws and processes discover themselves only to the scientific effort.

The roots of the mechanistic view in biology go back to early speculations on life, and since the sixteenth century—in fact, since in 1527 Paracelsus gave bio-chemistry its first charter¹—it has grown and spread, never more rapidly than in the last fifty years. It affirms that “living matter” is completely explainable as a physico-chemical system, so that organisation and regulation, those distinguishing marks or features of living bodies, are held to be properly conceivable in physico-chemical terms.

¹ Cf. J. Needham in *Science, Religion, and Reality*, p. 225.

And it is being more and more recognised in its true character of a scientific hypothesis, as such not requiring to make the claim for itself of being a last word in explanation or interpretation. If, however, the mechanistic view had to be accepted as a philosophical or metaphysical dogma, which it sometimes is in the hands of individual scientists, being regarded by them as explanatory or interpretative of the deepest meaning of organismal life, and of the universe generally, then a theistic believer would look upon it with disquietude. It would reduce the universe, without remainder, to terms of matter and energy (or matter-and-energy). But the mechanistic view in biology, as in physics, is not necessarily irreconcilable with the belief in divine Mind and Purpose.

Mechanistic theory in biology may be said to follow two main types, as far as regards its relation to the concept of purpose. Sometimes it has no traffic with teleology at all, and is still afflicted with what von Baer called "teleophobia," in its jealousy for the mechanistic explanation. Sometimes again—and this represents the predominant tendency—it finds room for the teleological view, reaffirming in fact the Aristotelian doctrine of the internal teleology of the living thing, which is its self-regulation.

In the *De Partibus Animalium* and other biological works Aristotle recognises, much more clearly than Plato does, the double play of mechanism and teleology in nature, more especially in organic nature, in which the refractory medium of matter is transcended. As a naturalist he is content to lay stress upon two forms only of causation, material or mechanical (ἐξ ἀνάγκης) and formal or final (οὐ ἕνεκα); and the formal or final cause comes first, being the reason which determines the whole process. The mechanical causes are the servants and instruments of the final causes. Thus in Aristotle both

mechanism and teleology are accepted as factors in the explanation of nature, though the Platonic principle predominates. Owing, however, to his scientific limitations, notably in connection with the mechanics of the heavens, but also in connection with biological theory, Aristotle pushes explanation by final causes farther than his general principles warrant. Sometimes resting upon final causes alone, he at once hindered the progress of his own scientific thought and lent his authority to the narrow and one-sided finalism of the scholastic interpretation. Yet, in many cases, it should be added, his use of the doctrine of the end enabled him to make discoveries which he would not have made on mechanical principles alone ; so that, as W. D. Ross says, he may be pardoned if his teleology "is sometimes too facile, and merely diverts attention from the genuine mechanical causation."¹

But the point which is particularly before us is, that Aristotle's organic or teleological doctrine, based on the metaphysical concepts of matter and form, strikingly anticipates certain modern positions in biological and psychological science. Applied, for example, to the conception of the organism, it offers, as Lawrence Henderson assures us,² a complete formulation of the biological principle of organisation. Aristotle conceives of the living thing as an autonomous unit, having the teleological principle within, and with every part functionally related to every other and existing as the servant of the whole. That is said to be the implication of his comparison of the organism to a well-governed commonwealth in which, once order is established, the individuals duly play their parts and a separate monarch is no more needed.³

¹ Aristotle, p. 128.

² *The Order of Nature*, p. 21.

³ *De Animalium Motione*, 10 (703a, 30-34).

With the more synthetic method involved in this prevalent Aristotelian type of mechanistic theory, which finds room for the concept of end or purpose, vitalism has appeared once more in the history of biological theory, if in subtler and more refined forms. Its roots also go back to early speculation, and we have been recently asked to see the antecedents of the present-day conflict between mechanism and vitalism in such contrasts in respect of the problem of life as those between Democritus and Plato, Lucretius and Tertullian, Descartes and Stahl.¹

For the issue between mechanism and vitalism in scientific explanation, Descartes is of considerable significance, not merely because of his concession to vitalism that the *vis viva* might alter the direction of motion, if, according to the law of conservation, unable to change its quantity, but chiefly because of his law of conservation itself. In the effort to reach the true principle of mechanical causation, he arrived at the belief that God conserved in things as a whole all the movement which He introduced into them at the creation ; so that in virtue of this initial disposition the necessary world-process was at every stage teleological. His somewhat negative contribution to vitalistic theory was shortlived, but his principle of conservation marks a notable advance in the teleology of nature.²

The difference between the prevalent mechanistic theory and the vitalistic hypothesis may be expressed in the distinction, already touched upon, which Driesch³ makes between static and dynamic teleology. Whereas in static teleology the processes

¹ J. Needham in *Science, Religion, and Reality*, pp. 226-231.

² *Principles of Philosophy*, pt. ii. § 36.

³ *Op. cit.*, p. 5 ; cf. also *The Science and Philosophy of the Organism*, 1908, ii. 135 ff. (*Philosophie des Organischen*, 2nd ed., 1921, p. 398 ff.).

of life are judged to be purposive in virtue of a given machine-like order or form underlying them, in dynamic teleology it is in virtue of their possession of a peculiar autonomy ; and dynamic teleology leads, as Driesch thinks, to some form of vitalism. I suppose that Lawrence Henderson, who is a mechanist, might then be also named a static teleologist ; for while on the whole persuaded that organisation (the central issue between the mechanism and the vitalism of to-day) is capable of explanation—although not as yet explained—in physico-chemical terms, he is also persuaded that the teleological concept of organisation, if to be found also in sociology and in the meteorological cycle, is a necessary biological category, and that a mechanistic physiology is at fault in not recognising this.¹ But though he thus believes with Driesch in teleology as “an irreducible peculiarity” of vital phenomena, he is not a dynamic teleologist in the neo-vitalist sense. He might allow that organisms, like machines, are inert embodiments of purposiveness ; he would not allow that they are actuated by purposiveness.

The anti-mechanists, or dynamic teleologists, also fall into two main groups. In the first are the neo-vitalists proper, of whom Driesch is the most prominent representative. They contend that biological processes are not properly explicable as physico-chemical processes within the living matter of the organism, but that some non-physical principle like Driesch's entelechy or unifying causality (a lineal successor of Paracelsus' “archæi” and Stahl's *anima sensitiva*) impresses itself upon those processes, to suspend, regulate, or control the physical and chemical reactions. With such a principle at work, the outcome of events, experimentally considered at least, is no longer determinate

¹ *Philosophical Review*, vol. xxvii. No. 6, 1918, p. 575 f.

and unequivocal. Bergson's *élan vital*, which we grasp by intuition, is such a non-perceptual determiner.

Now, as Bergson allowed and claimed,¹ the contention of neo-vitalism is relevant and weighty on the critical side ; but on its positive side it is beset with difficulties. Even granted the existence of the mysterious non-mechanical, semi-psychical entity postulated in the theory, it is impossible to say where and how it works in the biological processes ; and biological science is on that account reluctant to entertain it. An entity such as Driesch formulates, which is neither an energy nor a material substance but an agent *sui generis*, non-spatial, albeit acting into space, non-material, but logically belonging to nature, may have a peculiar fascination for the metaphysician, but will hardly retain a place for itself in the world of scientific explanation.² We are assured, moreover, that the second law of thermodynamics (the degradation of energy), which entelechy is said to be capable of suspending, will hold even in the obscure cases in morphology on which Driesch founds his theory.³ We are also assured that the non-physical something which is supposed to intervene in physical and chemical processes is invariably dependent upon the existence of physical and chemical conditions, yet it is not explained what part these conditions play in bringing about the actual results.⁴ Vitalism sets itself, indeed, a hard task in seeking to steer clear of the Scylla and Charybdis of the mechanical and metaphysical explanations.⁵

But even as a scientific hypothesis, this type of

¹ *Op. cit.*, p. 44 n.

² Cf. Titius, *Natur und Gott*, p. 764.

³ L. J. Henderson in *Philosophical Review*, vol. xxvii. No. 6, p. 574.

⁴ J. S. Haldane, *The New Physiology*, 1919, p. 137.

⁵ Cf. R. Eucken, *Main Currents of Modern Thought*, E.T., 1912, p. 181.

neo-vitalism appears to be already on the way to occupy an intermediate position. There is a group of anti-mechanists, or dynamic teleologists, who are more anti-mechanistic than Driesch, and their anti-mechanism may be regarded as designed to exercise not only a liberating influence in biology but in empirical science generally. Their position may be named, for want of a better word, "biologism." It is the biological, as distinct from the mechanical, theory of life. It is vitalistic in a sense, and its upholders may also be named neo-vitalists, for it asserts the impossibility of conceiving distinctively biological phenomena in physical and chemical terms. The autonomy of life is more for it than a static conception involving a teleological and non-mechanical relationship between mechanical things and processes. It is a dynamic conception, involving a dynamic teleology. But it is the living organism itself, and not some directive force within it, as in properly vitalistic theory, that is said to be dominant in organic activity. The organism exists as such, and its structure and activities are the expression of its existence. Here, as is claimed by J. S. Haldane,¹ a protagonist of the biological theory of life, we have a good working hypothesis, necessary to biologists, and capable of overcoming the failures of the mechanistic conception. Biology, as he urges, is something very different from physico-chemistry applied to life. Its phenomena differ, not merely in complexity but also in kind, from physico-chemical phenomena. Although physico-chemistry has much

¹ *The New Physiology*, p. 48; cf. also *Mechanism, Life, and Personality*, 1913; *Organism and Environment*, 1917; *Life and Finite Individuality* (two Symposia). In his Gifford Lectures, not as yet published, Haldane further defends this standpoint, maintaining the attitude of Hippocrates to be the only attitude possible in scientific biology (for Hippocrates the co-ordinated activity manifested in a living organism was nothing more than a visible and tangible manifestation of nature).

to teach us concerning the origin and destiny of the material and energy to be found in the bodily organism, it fails to throw light—so the contention is—upon the apparently teleological ordering of that material and energy. The insufficiency of the physico-chemical explanation appears when we enter into the deeper problems of the organism's activity, not to speak of such fundamental problems as those of reproduction and heredity. Animal heat, respiration, circulation—to take these examples from physiology—all contain teleological (that is, physiological) elements that do not fully respond to physico-chemical analysis. Life is a unity of structure, environment, and activity, and is not resolvable into mechanism. Separate a living part from its environment, or suspend its activity, and you alter it completely. What, therefore, matter and energy are to physics, or the atom to chemistry, the living organism is to biology. Let biology cease to follow Descartes the mechanist or Stahl the vitalist, and let it catch the spirit of Harvey the experimentalist, and it will advance and make better progress.

Haldane is further of opinion that, inconsistent with each other as are the biological and ordinary physico-chemical theories of life (so that personally he would as soon go back to the mythology of his Saxon forefathers as to the mechanistic physiology), a common meeting-ground between biology and physico-chemistry will yet be discovered. That will mean, however, not a reduction of the organic to the inorganic, but the inclusion of the inorganic within the domain of biology. In such an opinion the contrast between the principles of mechanism and what I have named "biologism" is sharply revealed, but with it we seem to be carried beyond the frontiers of natural science.

It appears to me, however, that in their bearing

upon scientific explanation the differences between the mechanist or static teleologist and the "biologist" or dynamic teleologist (if we may wrest Driesch's terms to our own use) are not so very radical after all. It is significant that Henderson accepts the mechanistic hypothesis as *upon the whole* most consistent with the evidence,¹ and that Haldane advocates the biological hypothesis because of the unsatisfactoriness of the *ordinary* mechanistic (that is, physico-chemical) explanation.² They both accept the principle of organic autonomy, and are in this good Aristotelians (as indeed Driesch is also), and possibly they would unite upon the formula, "Not mechanism or vitalism, but mechanism *and* teleology." This formula represents a thesis admirably supported by R. F. A. Hoernlé,³ who would make the particular point that, in biology, teleology—to be understood, no doubt, as a pale reflex of purpose—is not only compatible with mechanism, but logically dominant over it. Teleological terms are required, not as substitutes for physico-chemical terms, but to express the dominancy of the structures and processes of life, which cannot be reduced to exclusively physico-chemical terms without disregard of the difference—on which Bergson insists so eloquently—between the living and the dead. (It was the *vue d'ensemble*, the *Gesammtanschauung*, the complete, conjunct, or synoptic view—as we might note in passing—that Comte advocated in the study of the living; and the merely mechanistic view obviously falls far short of it.)

In an intimate and eloquent discussion of mechanism and vitalism, J. Arthur Thomson⁴—like

¹ *Philosophical Review*, vol. xxvii. No. 6, p. 576.

² *The New Physiology*, p. 49.

³ *Philosophical Review*, vol. xxvii. No. 6, p. 629 ff.

⁴ *The System of Animate Nature*, vol. i. lect. v.

Haldane an exponent of "biologism"—makes it abundantly clear that the biological theory is at present no more than descriptive or methodological; nor is it as yet determinate what its ultra-mechanical categories are or should be. He himself describes the organism in Bergsonian language as "a historic being which has traded with time, and has enregistered within itself past experiences and experiments, and which has ever its conative bow bent towards the future."¹ Hesitating to interpolate, with Driesch and the positive vitalists, a new agency or directive activity, he is content to say that the organism reveals new aspects of reality, transcending theoretically mechanical formulation. It is his central idea that the organism is a psycho-physical individuality; and it is his metaphysical hypothesis that, as the new aspects of reality exhibited in the lower organisms are analogous to those exhibited in the higher, such as intelligence and personality, so they have their infra-conscious and implicit analogues in inorganic nature, "which is but little different from the Aristotelian dictum that there is nothing in the end which was not also in kind in the beginning; but little different from the doctrine that in the beginning was Mind."²

¹ *The System of Animate Nature*, i. 160.

² *Ibid.*, p. 169.

CHAPTER XIV

PURPOSE AND THE SCIENTIFIC ORDER :

4. THE AUTONOMY OF THE NATURAL SCIENCES

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I SAID that the movement in biological theory which may be named "biologism," and which I have been seeking to expound in more or less general terms, may be regarded as designed to exercise a liberating influence in empirical science as a whole. A few words on this may be useful. The principle of the movement should be sufficiently clear, that while the phenomena of inanimate nature may be scientifically explained with the aid of mechanical and physico-chemical terms alone, the phenomena of animate nature—using the phrase broadly—demand for their adequate explanation more than mechanical and physico-chemical terms. In biology, which is the first of the natural sciences to meet us as we enter into the sphere of animate nature, the category of life cannot be resolved in terms of matter and energy; it is an irreducible category. In psychology, which meets us next, the category of mind or consciousness cannot be resolved in terms of life, much less in terms of matter and energy; it is also an irreducible category. In sociology, and, more specifically, in history—if we might so extend the scope of natural science, and thus dare to carry the principle still farther—the category of spirit cannot be resolved in terms of mind, much less in terms of life, and still much less in terms of matter and energy; it is also an irreducible category. Thus biology, psychology, sociology are each autono-

mous in their own spheres, and without the aid of the categories of life, mind, and spirit respectively, which are teleological, their problems cannot be adequately discussed, much less completely solved.

It should be explained that inasmuch as we are still dealing with the scientific order of nature, we have here no more, necessarily, than a logical or methodical scheme, for which no more is necessarily claimed than formal validity. It is only right to emphasise this in view of the pronounced tendency among modern scientific thinkers to set up the boundary of the natural sciences just where the philosopher, the metaphysically minded, is, as Whitehead says, "beginning to get excited."¹ In scientific theory, as he says again, the recourse to metaphysics is "like throwing a match into the powder magazine. It blows up the whole arena."²

Yet there is something both suggestive and impressive in this cumulation of categories of which I have been speaking, life superimposing itself upon mechanism, mind or consciousness superimposing itself upon mechanism and life, and spirit superimposing itself upon mechanism, life, and mind; and it is not surprising that this theory of the irreducibility of the categories has arrested the interest of theologians, as witness the issue of *The Modern Churchman* of September 1924.

It may be objected that the discontinuity of the categories apparently involved in the theory makes against a unified theory of nature, such as mechanism would establish. But a unified theory of nature does not require, says Hoernlé, "the reduction of all universals to one kind, or the restriction of all variables to one type of values," but may be achieved by "the correlation," or cumulative integration, "of different

¹ *The Concept of Nature*, p. 48.

² *Ibid.*, p. 29.

types or groups or levels of phenomena.”¹ It is such a correlation, or cumulative integration, that is now before us. Nor need exception to it be taken in the name of ultimate or metaphysical unity. The categories of mechanism, life, and mind, if fundamental hypotheses of natural science, are in the wider view of philosophy only provisional. And it is possible that, despite the apparent discontinuity of the categories, the principle of continuity may yet be vindicated in the scientific sphere, and that without subscription or surrender to the mechanistic hypothesis. Says Haldane, expressing an opinion on which I have already touched:² “The active persistence observed in the life of an organism can only be the manifestation of a type of order which has not yet appeared to us clearly in what we call the inorganic world. We are therefore bound to believe that, under the guise of mechanically acting forces and random distribution of different kinds of matter, this order must exist in the apparent inorganic world, though we cannot yet see it except with the eye of scientific faith. The time is probably not far distant when we shall be able to transform the present appearance of the inorganic world by tracing life in it. To a biologist the conception of evolution implies that sooner or later this transformation will be made. This will, however, be no advance towards a mechanistic conception of life, but a transformation in our conception of the apparent world of mechanism.”³ It appears to be a relevant consideration that, if the concept of life is ever to be extended by natural science to include the apparent inorganic world within its scope, the extension of it has been made easier by the new scientific conception of matter. The notion of material, as fundamental, is

¹ *Philosophical Review*, vol. xxvii. No. 6, p. 641.

² See p. 185 ff. ³ *Hibbert Journal*, 1922-23, vol. xxi. p. 419.

being replaced by that of organic synthesis. Science is becoming the study of organisms—biology of the larger, physics of the smaller. On the other hand, it is significant that when Whitehead would offer a new theory of reality, an objectivist philosophy adapted at once to the requirements of science and the æsthetic intuitions of mankind, it is a philosophy of “organic *mechanism*” that he upholds as against the older “scientific materialism,” with its abstract view of nature.¹

I have said that there is something suggestive and impressive in this cumulation of categories, as postulated in the conception of the autonomy of the natural sciences—a conception whose motto, as one of my students once said, might be taken from Deut. xix. 14: “Thou shalt not remove thy neighbour’s landmark.” It suggests a position of ideal or spiritual philosophy (and here we pass once more for a little from the scientific to the spiritual order of nature), that the categories of matter and energy, of life, of mind, and of spirit, are the forms which the riches of the spiritual world assume in their progress towards the truly real. The physical or physico-chemical order of nature, as disclosed to us by the mathematical and physical sciences, is abstract to a degree and far removed—one would think—from ultimate reality. The vital order of nature, as disclosed to us by the biological sciences, is less abstract, and more approximate to ultimate reality. Less abstract still, and still more approximate to ultimate reality, are the psychical and social orders, as disclosed to us by the psychological and social sciences respectively. Or to quote Haldane again, “The material world which has been taken for a world of blind mechanism is in reality the spiritual world seen very partially and im-

¹ *Science and the Modern World, passim.*

perfectly. . . . The world as represented in terms of biology is nearer to a true representation, but leaves out of account what is revealed in conscious behaviour. The apparent world of individual conscious interest comes still nearer to representing reality, but fails entirely to represent what is revealed in knowledge communicable to all men, in social life, and in our conscious relations to Nature. Religion is just the recognition that the only reality is in that supreme personal existence, that supreme personal spirit, which we discover in our conscious fellowship with one another, with Nature, and with those who have gone before and will come after us.”¹

But while all this has been said about the manifestation of purpose in nature, whether it be teleology of the static type as in Henderson, or of the dynamic type as in Haldane, the impression must not be conveyed that the thoroughgoing mechanistic hypothesis, which is not naturalism, and is much less materialism (these are philosophical or metaphysical rather than strictly scientific positions), may be ruled out of court. On the contrary, I understand that the majority of scientific theorists still hold to the faith that for the purposes of scientific exposition the mechanical categories will yet be found sufficient, at any rate in the biological sciences. Henderson, static teleologist as I have named him, is of this faith; and as for Haldane, Driesch, and Arthur Thomson, who have all been named neo-vitalists, their views, as we have been told, with what authority I know not, have found very little acceptance among zoological and physiological workers, and none at all among bio-chemists and bio-physicists. It is the variety and delicacy of the mechanism involved in the structure of the organism, as the mechanists urge in their *apologia*, that have complicated the

¹ *Science and the Modern World*, pp. 418, 430, 431.

task of exposition or explanation, and deferred the vindication of mechanism all along the line.¹

D'Arcy W. Thompson, for instance, in memorable language declares his adhesion to mechanism as a scientific hypothesis, and I would quote his words, taking them out of their exact context: "There is a certain castle among the famous castles of Touraine, and in it a great artist fashioned a staircase. . . . Round [its] central newel . . . wind side by side two separate stairs; the climber by the one stair sees nothing of those who pass or cross him on the other; there is no passage-way between—*until you come out at the top*. So it is, I suppose, with the teleological and the mechanical categories; and my path lies by way of these last. I know that there is another ladder towards reality, but I am contented with my own. I have been told that Galileo and Newton were at the building of it; and I am heartened by the sight of great names scribbled on the wall."²

Nor is it into the blank night of naturalism or agnosticism that this writer emerges, as he reaches the top of his winding scientific stairway; and other scientific adherents of the mechanistic view bear a similar testimony.

¹ Cf. J. Needham in *Science, Religion, and Reality*.

² *Proceedings of the Aristotelian Society*, 1917-18, p. 460.

CHAPTER XV

PURPOSE AND THE SCIENTIFIC ORDER:

5. THE SPHERES OF MIND AND SOCIETY

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I. THE SPHERE OF MIND.—If, as we have seen reason to believe, the concept of end or purpose is required in the scientific exposition of the world of organic nature, it is also required in respect of the world of mind or consciousness. The world of mind is indeed the native sphere of purposive activity, which reveals itself more fully to the scientist than to the ordinary observer, and only a very abstract view of it can dispense with teleological categories. According to W. R. Sorley's ¹ analysis, the contrast between a purely mechanical and a purposive system lies in this, that although purpose is consistent with the law of causation and the principle of the conservation of energy, yet as the result of a purpose or mental idea there is a liberation of energy passing from the potential to the kinetic form, and the same purpose may also control, non-mechanically, the direction of the movement. Therefore, it would appear that to describe the activity of a purposive system in purely mechanistic terms does not by any means account for it completely. Yet such a statement as this is challenged. The mechanistic hypothesis, which pursues us from the realm of inorganic nature into that of organic nature, still pursues us as we pass into the realm of mind. It is said that psychology, like biology and cosmology, should be able to dispense

¹ *Proceedings of the Aristotelian Society*, 1911-12, p. 216 ff.

with the concept of end or purpose, and to operate with physico-chemical terms alone.

The mechanistic psychology rests upon the Cartesian law of psycho-physical parallelism, which represents the relation between brain processes and psychical changes as one not of interaction but of concomitance, and it usually takes the form of the parallelistic hypothesis known as conscious automatism or psychical epiphenomenalism (*Begleiterscheinung*), in which inner or conscious states are accounted for as collateral products of the physical phenomena. According to Huxley's epiphenomenalism, the soul is related to the body as the bell of a clock to the works, and consciousness answers to the sound given by the bell when struck. Or in other language, the stream of consciousness is like the phosphorescent glow upon the sea, or the chain of foam-bells on the river, and it ceases with the cessation of the neural or physico-chemical processes which call it into existence. On such principles as are embodied in this form of psycho-physical parallelism the appearance of purpose or ideal direction is an illusion, and the consciousness of purpose either belongs to a different order or level of reality from that of the neural organisation or is simply a result or effect, however vague, shadowy, and impalpable, of the neural organisation itself. On the first alternative, every neurosis or neural process has its psychosis or mental process, but they cannot affect each other at all. On the second alternative, every neurosis or neural process has its psychosis or mental process, but the neurosis cannot react even a very little upon the psychosis. Either, then, the mechanical theory does not apply to consciousness, or the principle of the conservation of energy breaks down. The mechanist must either give up his case or deny the foundations of his faith. If this line of argument,

which is followed, *e.g.*, by James Ward,¹ be valid, then we are free to turn from the mechanistic hypothesis to one that allows full value to the purposive appearance of conscious life, say the animistic theory for which W. McDougall² has so strongly contended in recent times, or the double-aspect theory with which the name of Lloyd Morgan³ is associated, and which Arthur Thomson⁴ favours as in line with his biological contention, already noted, largely based on the study of behaviour, that the organism is a psycho-physical unity. The characteristic feature of the animistic theory is the idea of interaction, or the reciprocal influence of mind and body. The characteristic feature of the double-aspect theory is the idea of a unified organismal life, with its two aspects of psychosis and neurosis, its two abstractions of mind and body. On either theory there is ample room for the recognition of the reality of purpose in conscious life, whether genetically or systematically viewed. And this holds even more of Bergson's theory, in which consciousness, so far from being a product or a mere accompaniment of the bodily process, is itself creative of it.⁵

Accordingly, I do not dwell upon the relation of the concept of purpose to the scientific order in the sphere of mind or consciousness; but let us notice more specifically than we have yet done, how the anti-mechanistic view is illustrated in this sphere, as in the sphere of organic nature, in the movement whose watchword is "the autonomy of the natural sciences." As in the sphere of organic nature we named the movement "biologism," so in this sphere of mind we might name it "psychologism," though

¹ *Naturalism and Agnosticism*, vol. ii. pt. iii.

² *Body and Mind*, 1911.

³ *Scientia*, 1915, xviii. 1-15.

⁴ *The System of Animate Nature*, lect. vii.

⁵ See *Matière et Mémoire*, E.T., 1911, from 5th ed., 1908.

it is to be remembered that "psychologism" has another meaning in religious philosophy, being the theory that when psychology of religion has fulfilled its descriptive function, nothing more is to be said, or can be said, about religion. In "psychologism," in the scientific reference, psychology is more than physiology, just as in the biological theory of life biology is more than physico-chemistry. As J. S. Haldane says, a merely physiological psychology is as inadequate as a mechanical physiology. A conscious organism, which reacts not only in space but also in time, and which in its temporal relations joins itself both to the actual past and the potential future, shows itself to be more than a mere organism, such as we commonly regard a plant as being. Its relation to the environment, established through perception and volition, is no mere external thing, as in the case of a mere organism. There is a real connection between the internal organic world and the external world. The environment is "teleologically determined" by organic needs, and but for this "teleological determinism" the world of conscious experience would lack unity and coherence. To disregard the psychological aspect of living things, especially human beings, and to describe their behaviour in other than psychological terms is to deal unduly in abstractions.¹

A. E. Taylor² speaks of two functions of psychology. The first, which is not its proper function but which it exercises "pending the majority of cerebral physiology," is to set forth mental processes as mechanical uniformities of sequence. The other function is to treat of purposive activities and adjustments, and thereby to afford a suitable terminology for the sociological sciences, and in particular

¹ *Mechanism, Life, and Personality*, p. 111 ff.

² *Elements of Metaphysics*, 1903, p. 306.

ethics and history. Apart from the teleological symbols supplied by psychology, ethical appreciation and historical interpretation would be impossible. With this let us pass to the consideration of teleology in the sphere of society or of personal spirits.

II. THE SPHERE OF SOCIETY.—Passing, then, from the sphere of mind to the sphere of society, of the human spirit, in which the purposeful activities of persons or selves are indubitably manifest, we find that the teleological standpoint has its place in *ethical theory*, just as teleological symbolism necessarily enters into the common-sense appreciation of conduct. Among the possible divisions of ethical theories, a fundamental one is into the teleological and the formal or jural. In the first case the moral standard is represented by the idea of good or value, in the second by that of duty or right. The teleological theory, which is found in Greek philosophy, may take the form either of hedonism or of energism—to employ an Aristotelian term borrowed by F. Paulsen.¹ With Aristotle, as with Plato, the ethical end or ideal was the good personally realised in social relations as the actualisation or full fruition of human powers and capacities. In modern ethical theory both the hedonistic and energistic forms of the teleological method have been revived.

The formal or jural method is older than the other, as attaching itself to the legalistic stage of religion. Through Judaism it entered into theological ethics; and it received classical exposition at the hands of Immanuel Kant, whose ethics is based on the original mental principle of the good will. As against a Kantian formalism and in favour of the teleological standpoint in ethical theory, it has often been urged that norms and motives of action are not abstract and transcendent principles but, as psycho-

¹ *Introduction to Philosophy*, E.T., 1895, p. 421.

logy and history teach us, generalised rules of the will which grow out of individual and social experience ; and their value consists, not in defining, but in their power of promoting the ideal end.¹

In the sphere of ethical science also we have still to reckon with the mechanistic theory, but it will be sufficient to take this point under historical science, which must embody a view or views, mechanistic or otherwise, of human motive and conduct.

We proceed, then, to notice that the teleological principle is applied to the interpretation of *the process of history* as well as to the elucidation of ethical theory. Already, under the influence of Christianity, a teleological view of history had taken shape in the ancient and mediæval Church. For Augustine the human race was a teleological unity, as being destined to receive entrance into the catholic or universal Church (*civitas dei*). Through his doctrine of the State, Thomas Aquinas gave this idea a more systematic expression. The State was not with him, as with Augustine, the devil's province (*civitas huius seculi*), but was founded on natural law or right, which has its source in God ; and the life of virtue, which Aristotle said was to be realised in the political society, was the preparation for the higher life of grace in the society or community of the Church. Just as natural theology precedes supernatural or revealed theology as the *preambula fidei*, so we might say that natural law precedes supernatural or revealed law, the life of virtue the life of grace, as the *preambula vitæ æternæ*. "Gratia naturam non tollit sed perficit." But it was not until Lessing and Herder, or rather not until Hegel, that history was reflectively and intimately treated in the light of the Aristotelian principles of continuity and development.

¹ Cf. G. Galloway, *The Principles of Religious Development*, 1909, p. 235 ff.

Even in the sociological sphere of history, as already hinted, we meet with and have still to face the mechanistic theory, however irrelevant—from a common-sense standpoint at least—we may regard the hypothesis of mechanical causation in this sphere, however convinced we may be that psychical events in history are not properly estimated by sub-personal categories.

J. S. Mill, for example, acknowledged the principle of continuity, but in his “inverse deductive method” he applied to historical development the mechanising principles of Democritus and Descartes, treating history as a kind of social dynamics, human motives and actions as causes and effects, and the course of events as a rigorously determined sequence. “That which is only probable when asserted of individual human beings indiscriminately selected, [is] certain when affirmed of the character and collective conduct of masses.”¹ Similarly, Herbert Spencer, although—here following Comte—he applies the idea of organic evolution to the explanation of the historical process, never really breaks with the conviction—“fixed probably in his mind through his engineering education”²—that change and progress in society, as in nature and mind, are explicable on mechanical principles.

But another type of historical theory is represented by Hegel, for whom the course of events is a continuity not of mechanical causation but of evolutionary development. “As the germ carries within itself the whole nature of the tree, the flavour and the form of the fruits, so the first vestiges of mind (*Geist*) virtually contain the whole history.”³ Thus for him history is still a rigidly determined move-

¹ *Logic*, ii. 428, quoted by G. Galloway, *op. cit.*, p. 7.

² J. T. Merz, *History of European Thought*, iv. 519 n.

³ *Philosophie der Geschichte*, ed. 1848, p. 21.

ment, fixed in all its stages ; but it is teleologically conceived, the end dominating the process. And we must allow that teleology, in society as in the individual, is not inconsistent with necessity.¹ For Hegel, as we may add, the history of society is the necessary evolution of the immanent Idea. Through human interests and actions the final purpose of history is carried out, but the purpose itself—such is the absolute cunning of reason—is beyond and external to human interests and actions.²

It may be here noted that both J. S. Mill and Hegel, the latter more distinctly, bring the individual element in history under the dominion of the universal. The former attributes to great men the power rather of accelerating than of directing a movement ; the latter attributes to them the power of bringing to consciousness the unconscious inwardness of a movement. On the other hand, there are those who magnify the influence of great men, refusing to subordinate the individual factor in history to the universal. For Carlyle the history of the Great Men is the very marrow of the world's history, which is at bottom *their* history.³ For William James even, who is very conscious of the power of the social environment in the world's history, the power of individual initiative effects a rearrangement or redirection of social relations. "The evolutionary view of history," he says, "when it denies the vital importance of individual initiative, is . . . an utterly vague and unscientific conception, a lapse from modern scientific determinism into the most ancient oriental fatalism."⁴

Sir J. G. Frazer expresses a similar opinion in reference to the position of those who would doubt or deny the historical reality of Buddha or Christ :

¹ Cf. J. Laird, *A Study in Moral Theory*, 1926, p. 178.

² Cf. J. Ward, *Realm of Ends*, p. 149.

³ Cf. *Heroes*, s.i.

⁴ *The Will to Believe*, 1897, p. 245.

"The great religious movements which have stirred humanity to its depths and altered the beliefs of nations spring ultimately from the conscious and deliberate efforts of extraordinary minds, not from the blind unconscious co-operation of the multitude. The attempt to explain history without the influence of great men may flatter the vanity of the vulgar, but it will find no favour with the philosophic historian." ¹

It may be objected to the organic view of history that, in so generalising the conception of historical development, it does not bring out the real nature of history as a process of interaction between human minds and wills, thus failing to offer a true rationale of progress. A better explanation of the historical process is implied in the words of G. Galloway, who, following Siebeck, says: "Progress is the spiritual vocation of humanity: it is a task which it sets for itself, not an inherent necessity of its constitution. The . . . ideal is freely pursued, and what ought to be is never that which perforce must be." ² In other words, the organic view of history, and still more the mechanical or mechanistic view, is to be replaced by the historical or spiritual view, in which the freedom of human personality is more clearly acknowledged. In a real sense we can apply Bergson's famous phrase to the history of a people, and of society as a whole, and say that "the gates of the future are open." ³

This spiritual or personalistic view of history may be named "historicism." Just as, according to J. S. Haldane and others, mechanism, or the mechanistic theory of matter and energy, in the physical world, gives place to "biologism," or the biological theory of life, in the world of organisms, and "biologism" in its turn to "psychologism," or the psychological theory of mind or consciousness, in the mental

¹ *The Golden Bough*³, *Adonis*, etc., i. 311 n.

² *Op. cit.*, p. 43.

³ Cf. *Creative Evolution*, E.T., p. 110.

world; so "psychologism" in its turn may be regarded as giving place to "historicism," or the historical theory of spirit or personality, in the spiritual world.

But we need not jeopardise our view of history by thus linking it with the hypothetical conception of the autonomy of the natural sciences. Let us seek to associate it, however, with our concept of purpose, by distinguishing it from the mechanical and teleological determinisms above-named, as teleological indeterminism. For in it spiritual or historical development is not the necessary effect, as it were, of an impulsion from behind or an attraction from before, but is a process in which something new or indeterminate appears. It proceeds, to borrow a term of embryology, by epigenesis, or, as Wundt says, by creative synthesis, or, in the evolutionary term with which C. Lloyd Morgan and S. Alexander have familiarised us, by emergence.¹

It may be observed that teleological indeterminism in the theory of historical science naturally leads in metaphysics to a form of spiritual pluralism, whether non-theistic or theistic; that teleological determinism makes a ready alliance with pantheism; and that mechanical determinism is at home in a naturalistic or positivistic setting. Yet it is not without significance that in J. S. Mill, cited as an exponent of the mechanistic view, a survival of the deistic tendency in thought is to be found. For it may not unjustly be said that deism, as a dogmatic or theological position, with its shallow rationalising of religion and its mechanical conception of the relation of God to the world, largely promoted what J. Royce calls the "mechanistic dogma." An absent Deity, a *deus absconditus*, may be dispensed

¹ This term was used by G. H. Lewes (*Problems of Life and Mind*, 1874 79, ii. 412; cf. S. Alexander, *Space, Time, and Deity*, 1920, ii. 14).

with altogether, so long as the mechanism of the universe keeps going. A God who normally *does* nothing encourages the idea that He *is* nothing. At any rate, naturalism, deism, pantheism, and pluralism will meet us as we pass from the world of scientific description and explanation into that of philosophical and religious interpretation, still pursuing our concept of purpose. We moved in the world of philosophical and religious interpretation when at the outset we considered the principle of natural theology, but then we were not specially dealing with the concept of purpose. Since then we have been content at times to look across the boundaries between the empirical orders of nature and the spiritual or metaphysical order, with the concept of purpose specially in view. But now we must actually cross them if we are to bring our discussion of the concept of purpose to a fit and proper close.

CHAPTER XVI

PURPOSE AND THE SPIRITUAL ORDER :

1. THE LIBERATING INFLUENCE OF BIOLOGY

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1. THE LIBERATING INFLUENCE OF BIOLOGY

As we view the world in its totality and seek to discover its meaning, we advance from pictorial description and logical or scientific explanation to spiritual interpretation. Here we are face to face with the metaphysical aspect of teleology or purpose, which is the aspect—as we must have gathered—it has chiefly presented in the history of thought. The need of a religious and philosophical interpretation of the world has always been more or less consciously felt, and in recent years there has been a renewal of interest in the deeper problems of nature, mind, and spirit. There has been a pronounced tendency even among natural scientists to enter into the “foreign field” of metaphysics, a tendency largely due to the increasing recognition that naturalism, no more than materialism, speaks the last word on the perennial metaphysical problems. That this is being increasingly recognised is to no small extent the result of what A. S. Pringle-Pattison calls the “liberating influence of biology.”¹ We have already noticed the idealistic positions of J. S. Haldane and J. Arthur Thomson, and Driesch has advanced beyond a conceptual phenomenalism, having even formulated a critical metaphysic which leans to theism.

But other biological writers too, adherents of the mechanistic way of approach, refuse to be called naturalists or materialists in the ultimate sense. This we have also noticed ; and now I should like to

¹ *The Idea of God*, p. 86.

add that no more striking contribution to idealistic doctrine has been made from the scientific standpoint of a naturalism which repudiates the older mechanism than that contained in the two series of Gifford Lectures by C. Lloyd Morgan. These Lectures are a contribution to the study of evolution as a philosophical theory. It is a naturalistic conception of evolution that is developed in them, not only of physical or cosmical but also of biological and psychological evolution. An immanent activity is postulated as working upwards from matter through life to mind and as attaining in man its highest level. All the world-events considered in physics and chemistry, in biology, and in psychology, are regarded as susceptible of naturalistic interpretation in an evolutionary plan of orderly advance—from the autonomous atom through the molecule and the crystal unit with its “first cousin” the colloidal entity, to the new and richer modes of substantial unity manifested successively in life and in mind.¹ Further, the evolutionary plan of events is of spiritual significance. There is no “disjunctive antithesis” between evolutionary progress and divine Purpose. There is an autonomy wider even than that of life or of mind, namely, the autonomy of the whole realm of spiritual activity. This indeed is the statement in which the Lectures may be said to culminate; and it is supported throughout in the light of the principle of “emergent evolution.”

In the earlier series of Lectures, bearing the title of *Emergent Evolution* (1923), a simple illustration is given of the meaning of this key-concept of emergence, the emergent being contrasted with the resultant. “When carbon having certain properties combines with sulphur having other

¹ See the same writer in *The Modern Churchman*, Sept. 1924, pp. 282–293.

properties there is formed, not a mere mixture but a new compound, some of the properties of which are quite different from those of either component. Now the weight of the compound is an additive resultant, the sum of the weights of the components ; and this could be predicted before any molecule of carbon-bisulphide had been formed. One could say in advance that if carbon and sulphur shall be found to combine in any ascertainable proportions there will be such and such weight as resultant. But sundry other properties are constitutive emergents which (it is claimed) could not be foretold in advance of any instance of such combination.”¹ Now it is Lloyd Morgan’s objection to the mechanical or mechanistic interpretation of evolution that while it recognises resultants it ignores emergents. It regards a chemical compound as only a more complex mechanical mixture. It regards life as only a regrouping of physico-chemical events. But in a naturalistic interpretation, such as he himself professes to offer, emergence, in all its ascending grades, is loyally accepted with “natural piety” (Wordsworth’s phrase as adopted by S. Alexander,² who puts forward a similar view).

In the later series of Lectures, *Life, Mind, and Spirit* (1926), the emphasis of Lloyd Morgan’s treatment falls on the evidence in biology and psychology for “a threshold of emergence”³—of life, of successive levels of mind, of spiritual attitude of mind. Each new stage of progress is regarded as a new and emergently higher character or quality of the natural and at the same time a further manifestation of divine Purpose, which is timeless and omnipresent. “Naturalistic interpretation may be supplemented by spiritual explanation without any savour of contradiction.”⁴ “The same array of facts may afford

¹ P. 3.² *Op. cit.*, ii. 47.³ P. xiii.⁴ P. 300.

instances of determinate plan in naturalistic regard and of Divine Purpose in religious or spiritual regard.”¹ The writer repudiates, however, any dualism of the natural and the supernatural. The one realm of reality is both natural and spiritual in ultimate unity of substance, but is not both natural and supernatural, if this implies ultimate diversity of orders of being. Spiritual agency is operative always and everywhere, being manifested not only in life and mind, but also in the evolutionary foundations from which first life and then mind have emerged. “All that we call rational is due to one agency within one coherent plan and has spiritual significance in God.”² “The rational order in nature, including human nature, is not other than Divine Purpose.”³ God is All in all, but in diverse modes and degrees of manifestation; and divine Purpose, manifested in life and mind, is one and indivisible in God as ultimate Substance.

The Spinozan flavour of all this is obvious. Indeed, confessedly, it is “back to the foundations laid by Spinoza.” Like S. Alexander, Lloyd Morgan conceives of evolution, as a philosophical principle, not as materialistic or mechanistic in character but as involving “an incoming of the new.” But with neither of these writers does the theory of emergent evolution lead to transcendence. It may yield, however, an immanent teleology in the full philosophical sense. But, as W. R. Matthews asks, does not immanence, here as elsewhere, imply transcendence? And does not transcendent teleology in its turn imply transcendent thought? The Logos, he adds, cannot be regarded as the whole truth of theism.⁴

With these remarks let us draw closer to the subject of the concept of purpose in the spiritual order of nature.

¹ P. 300.

² *The Modern Churchman*, Sept. 1924, p. 292.

³ *Life, Mind, and Spirit*, p. 303.

⁴ *God and Evolution*, 1926, p. 49.

CHAPTER XVII

PURPOSE AND THE SPIRITUAL ORDER :

2. THE CONCEPT IN HISTORY

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FIRST let me interpolate a short account of the history of teleological interpretation. Readers who are interested in metaphysical teleology, from the critical rather than the historical standpoint, might do well to pass on to the next chapter.

I. THE ANCIENT PERIOD.—ANAXAGORAS (c. 500–428 B.C.) has been hailed as the father of teleology, but he is so only in a qualified sense. His explanation of nature—to judge from the fragments of his *Περὶ Φύσεως* preserved by Simplicius and from the references in Plato and Aristotle—appears to have been virtually a mechanical explanation on the basis of a qualitative atomism, nor is it even certain that his First Cause of motion was an immaterial or incorporeal essence.¹ The movement and order of the universe he ascribes analogically to *Noûs* (Mind, Intelligence, Reason), which by an initial impulse imparted a rotatory motion to the pre-existent chaos in which “all things were together.” But, once the rotatory motion was set up, *Noûs* apparently—like the deistic deity—had little else to do. It may be that a thoroughgoing teleological view of nature is logically involved in the Anaxagorean doctrine of *Noûs*, whether *Noûs* (which is represented as omniscient and omnipotent) be regarded as a spiritual or a corporeal essence, as mind or mind-stuff. On the

¹ Windelband has no doubt but that the *Noûs* was “a space-filling matter or stuff” (*A History of Philosophy*², E.T., 1919, p. 42 n.).

other hand, it is altogether probable that Anaxagoras did not carry out the full implications of his doctrine. Socrates in the *Phædo*¹ complains that in actual explanations Anaxagoras called in only mechanical causes—"airs, æthers, waters, and such-like absurdities"; and Aristotle in his *Metaphysics*² (in a passage reminiscent, as Burnet allows,³ of the passage from the *Phædo*) charges Anaxagoras with making use of *Noûs* merely as a *deus ex machina*, to account for the formation of the cosmos or for phenomena that he could not explain on mechanical grounds. Similar objections, as James Adam⁴ reminds us, were afterwards urged against Descartes and Newton. But however we may interpret the Anaxagorean concept, we cannot but recognise its significance in the history of thought.

The teaching of Anaxagoras was apparently influential upon his contemporary, DIOGENES OF APOLLONIA, who attributes *Noûs* to his primary substance, air, inasmuch as all things are "disposed in the best possible manner"—a phrase which sends one's mind on to Leibniz and his theological optimism. But it is impossible to say whether Diogenes followed up his affirmation of purpose or design in nature any farther than Anaxagoras appears to have done; and this difference between them remains, that, whereas with Anaxagoras the teleological inference is in the direction of theism, with Diogenes it is definitely pantheistic.

The teleology of SOCRATES is to be found in the *Phædo* and the *Memorabilia*. The Socrates of the *Phædo* expresses himself as mightily pleased with the book of Anaxagoras in which *Noûs* is affirmed to be the cause of all things, but as disappointed with

¹ 97 B, 8.

² i. 4 (985a, 18 ff.).

³ *Early Greek Philosophy*², 1908, p. 310.

⁴ *The Religious Teachers of Greece*, p. 263.

the failure of Anaxagoras actually to transcend the mechanical view. He is dissatisfied with a philosophy which cannot show how everything finds itself as it is because it is best for it so to be. He has grasped the distinction between mechanical and final causes in nature, and discovers only in the latter a true ground of explanation. To rely upon mechanical causes alone would be as absurd as to say that the real reason or final cause of his own sitting in prison was certain bodily dispositions, and not his mental resolve to abide by his sentence, as the best thing to do. Had this not seemed to him the best, then "by the dog, these muscles and bones would have been off to Megara or the Bœotian frontier long ago."¹

Consistently with this representation in the *Phædo* the Socrates of the *Memorabilia*² is found affirming an immanent Reason in the world, and consistently too with the general doctrine of the Platonic Socrates concerning the individual and the State (which Adam would sum up as "Noocracy," or the supremacy of *Noûs* or Reason³). At the same time the Anaxagorean concept receives in the *Memorabilia* a development so one-sided that it becomes difficult, if on no other ground than this, to believe in the representations of Socrates in Plato and Xenophon respectively as both even essentially historical. Windelband suspects the influence of Cynicism and Stoicism upon the representation in Xenophon. In any case it is an external and anthropocentric teleology that is here formulated. The whole world of nature is said to show traces of design, as appears in particular from the wonderful adaptations of means to end in the structure of the human body, in man's psychical constitution, and in the phenomena of external nature; and furthermore, all is designed towards the end of the advantage and well-being of

¹ *Phædo*, 98.² I. iv.; IV. iii.³ *Op. cit.*, p. 342.

men. Plants exist for the lower animals, and the lower animals for the sake of man. It was perhaps the Socrates of the *Memorabilia* who gave the first formal exposition of the argument from design. Formally, and often naïvely, he argues from the evidences of design in nature to the existence of an intelligent or beneficent Deity (σοφοῦ τινὸς δημιουργοῦ καὶ φιλοζώου).¹ This external and anthropocentric teleology, with the theistic inference associated with it, impressed itself strongly upon subsequent religious thought.

The teleology of PLATO is so far indicated in what has been said regarding the Socrates of the *Phædo*, but it has a deeper philosophical setting than can actually be found in Socrates. In keeping with his ethical and social philosophy, Plato seeks in his metaphysics to interpret the real in terms of the end or ideal of the Good. Ethics is for him the foundation of metaphysics, as it came to be for Lotze, and reality yields up its secrets according as its ethical meaning is apprehended. His conception, already adumbrated in the *Phædo*, of a "Jacob's ladder of science," as Edward Caird calls it,² beginning with the lower principles of explanation and reaching to the highest principle of unity or the Idea of the Good, by which all the others are explained, is worked out more fully in the *Republic*.³ The Good or Universal Reason is the final cause of every event and change, and to the Idea of the Good all the other ideas are teleologically subordinate. The Good, as we may learn from a famous passage of the *Laws*, is the perfection of the whole; and in the preservation and perfection of the whole every creature has its own proper end to fulfil. Thus it was that Plato sought by means of his theory of ideas to interpret the rational principle of

¹ I. iv.

² *The Evolution of Theology in the Greek Philosophers*, 1904, i. 129.

³ Bk. vi.

Anaxagoras more adequately. He looks upon the world, says J. Hutchison Stirling, as "a single teleological system with the Good alone as its heart."¹

In applying his metaphysical principles to the interpretation of nature, Plato is hardly liable, like the Socrates of the *Memorabilia*, to the charges of externality and anthropocentrism. For the *Timæus*, in which such a teleology may be found, is, in its details at least, "mythical." In consistency with his theory of ideas Plato could not have claimed more for his accounts of the phenomenal world than that they were "likely stories" (*εἰκότες λόγοι*). In any case he does not, even in the *Timæus*, lay much stress upon particular instances of adaptation in nature, nor does he encourage the notion of adaptations as designed exclusively for human needs. In the *Timæus* a theological interpretation is offered of the teleological constitution of the world. In offering it, Plato would apparently overcome the dualism between the ideal and the phenomenal which is inherent in his theory of knowledge and reality. God, the Demiurge, is represented as bringing order and harmony out of the moving chaos of not-being (*μὴ ὄν*), in accordance with the pattern of the Good, and in so far as natural necessity (*ἡ ἀνάγκη*) allows. Thus natural necessity comes in when divine activity, according to ends, fails as a principle of explanation, and something is yielded to Democritus. But, while the teleological explanation involves a recognition of divine activity, and is so far on the lines of the theistic argument, the Demiurge of the *Timæus*—the self-moved mover who fashions the world—is not identified with the Good, nor is He to be equated with the God of modern theism.²

While it may be allowed to Plato that no ultimate

¹ *Philosophy and Theology*, 1890, p. 113.

² See also pp. 92-94 of the present work.

explanation of anything is possible apart from the discovery of its final cause, we have to turn to ARISTOTLE for a more adequate recognition of mechanical causes as principles of explanation, and this although Aristotle is the protagonist of the organic and teleological view of the universe. In the endeavour to overcome the Platonic dualism of ideas and things, Aristotle gives an even more thorough-going interpretation of the Anaxagorean *Noûs* than is to be found in Plato. With Plato he believes in the real existence of the form or idea, but he cannot allow it to be separate from the world. It exists in the world and in things. Reality is a process of development in which the change from more imperfect to less imperfect being is to be interpreted in the light of the *τέλος* or end, which in things that are not eternal is the moving form (*μορφή, λόγος, εἶδος*) of actuality (*ἐνέργεια, ἐντελέχεια*). The moved matter, which is the primal state of potentiality (*δύναμις*), exists for the sake of the form. The individual is both form and matter, being form in relation to what is lower in the scale of being, and matter in relation to what is higher. The marble is form in relation to the materials composing its substance, and matter in relation to the statue which is made from it. The tree is form in relation to the elements of the soil that enter into the process of its growth, and matter in relation to the house built of it. The Good is the highest form of all, being pure form without matter, and is the ultimate end or final cause of all existence and all movement. It is not actually generated in the world-process, but is eternally implied in it, as the goal of the creation.¹

¹ In W. Durant's entertaining *Story of Philosophy*, we are reminded that, according to Aristotle, the male is the active, formative principle and the female passive clay, waiting to be formed; and that female offspring are the result of the failure of form to dominate matter (*De Gen. An.*, i. 2).

With this speculative idea of development, Aristotle opposes the Ionian physicists, who appeared to him as mere "random babblers" ¹ in comparison with Anaxagoras. It is an immanent teleology that Aristotle works out. Form is immanent with him, not transcendent as with Plato. Even in inorganic nature he finds purpose resident and operative. Just as an army moving on the field, or a ship cleaving the sea under full sail, offers an instance of effort directed towards an end, so wherever we observe in natural processes the regular achievement of results, we may similarly discern the presence of purpose. But it is principally the realm of organic nature that is viewed thus teleologically by Aristotle, as in his work *De Partibus Animalium* and other biological works. He is of opinion that final causes are of more importance for the biologist than efficient causes, just as they are for the physician or the builder in setting about his work. How absurd (as he says in the *Physics*) to ascribe the forms and activities of living beings to the operation merely of the fortuitous (τὸ αὐτόματον) or luck (ἡ τύχη)! Empedocles was emphatically wrong in his doctrine of the origin of species (none the less it was a brilliant conjecture, as we may now recognise), in which he avers that nature produces in her prodigality every possible type of animal form, and that only those forms survive which are coherently and consistently constructed. If, as Empedocles believed, nature once produced "man-faced cattle" (βουγενῆ ἀνδρόπρωρα), presumably she also produced at one time or other "olive-faced grapes"! Nature is a cause which acts purposively, and if her end is sometimes unattained, it is due to the mechanical necessity to which matter is subject.²

¹ Cf. *Metaphysics*, i. 3 (984b, 15).

² *De Anima*, ii. 4.

But I have already ¹ had occasion to speak of Aristotle's view of teleology in nature, especially in organic nature, and what more concerns us at this stage is his metaphysical standpoint. His teleology is of a thoroughgoing character. All existences and events in the universe are declared to be subservient to an end or purpose. The question is, To whose purpose? God's or nature's? Interpreters of Aristotle are divided as to the right answer. Perhaps Aristotle himself would have refused the alternative, although it may be that as he became older he withdrew more and more from Plato's influence, and would have inclined more and more to the second alternative. W. D. Ross, following Jaeger, is persuaded that the general movement of Aristotle's thought was "from otherworldliness towards an intense interest in the concrete facts both of nature and of history, and a conviction that the 'form' and meaning of the world is to be found not apart from but embedded in its 'matter' and actual structure." ²

It may be said that to adopt the first alternative and to answer that all existences and events are subservient to divine Purpose would be to make Aristotle inconsistent with his own theology. The Unmoved Mover is the object of the world's desire, but, as engaged in self-contemplation, is unconscious of the world's existence. But Aristotle has actually shown himself to be thus inconsistent with his own thought, as when God is compared to the captain of an army, or to the ruler of a people, or when the world is compared to a well-ordered household; as when Anaxagoras is praised for his ascription of the world's order to reason; or as when it is said, "God and nature do nothing in vain." ³ Those who would maintain the consistency of Aristotle's thought must

¹ See p. 180 ff.

² *Aristotle*, p. 19.

³ *De Cælo*, 271a, 33.

affirm that in such passages he accommodates himself to ordinary ways of thinking.

What, now, of the second alternative? If we answer that, according to Aristotle, all existences and events in the universe are subservient to nature's purpose, the further question presses, Is nature's purpose conscious or unconscious purpose? In favour of the answer that nature's purpose is conscious, many passages of a pronounced anthropomorphic flavour might be cited. It is an exceptional thing for Aristotle to attribute purposive action to God, but he often says, "Nature does nothing in vain." Here, again, we are asked to believe that this is but a literary device, a concession to ordinary ways of thinking, and that in reality no more than a *de facto* teleology is stated. Nature in this context is not a transcendent principle or conscious agent, but a collective term for the natures of all natural bodies. Thus are we thrown back finally upon the answer, that in Aristotle's thought all existences and events subserve nature's purpose, and nature's purpose is unconscious purpose. Perhaps it is a true interpretation of Aristotle's teleology; yet one cannot but sympathise with the dissatisfaction which W. D. Ross feels with the notion of unconscious purpose, despite the prevalence of its use among modern thinkers: "Unconscious teleology implies a purpose which is not the purpose of any mind, and hence not a purpose at all."¹ As S. A. McDowall says, in a phrase of which he would almost make a slogan, "Purpose presupposes personality."²

Among the so-called sects that came after Plato and Aristotle, the SCEPTICS had no contribution to make on metaphysical teleology. If causality was

¹ *Op. cit.*, p. 186.

² *The Modern Churchman*, September 1924, p. 252.

suspect with them, as with Hume in a later age, so too was finality. The contribution of the EPICUREANS was distinctly negative; Epicurus (despite the doctrine of the *clinamen*) is to be classed with Leucippus and Democritus, of whom Aristotle said that they "rejected design and referred all to necessity."¹ Negative also was the contribution of STRATO OF LAMPSACUS, an Aristotelian, who though opposed to the mechanical explanations of the atomists, yet—as Windelband puts it—"threw away the keystone of the Aristotelian teleology."² He denied the existence of pure form as of pure matter, declaring form to be always immanent in matter, and so converting the Aristotelian system into a consistent naturalism. But the STOICS recognised the principle of teleology. Their system may also be described as naturalistic, but it was at the same time pantheistic, or, better, cosmo-theistic. *Quid aliud est natura quam Deus?*³ The old dualism of form and matter which Plato and Aristotle had inherited from Anaxagoras, and had failed to throw off, gave place to an eclectic and somewhat facile monism, in which one eternal substance manifested itself as spirit (λόγος σπερματικός) and matter (πνεῦμα διάπυρον). It was essentially a teleological explanation of the world that was given by Stoicism, because, although every particular phenomenon was said to be determined by natural necessity, as Democritus had maintained, natural necessity was not based, as with the atomists, on quantitative differences and initial movements, but depended on the vital activity of the whole.

In carrying out its teleology, Stoicism made much of the beauty, order, and harmony of the world and the adaptations of means to end, especially in

¹ *De Gen. An.*, v. 18.

² *History of Ancient Philosophy*, p. 301.

³ Seneca, *De Benefic.*, iv. 7.

organic nature, as manifestations of the rational unity and ideal meaning of things. The evils of the world, which offered even more difficulty on the monistic hypothesis than in the Platonic and Aristotelian systems, were optimistically explained as instruments or concomitants of the great cosmic movement, and it was said that they would be recognised as such, if the individual could take the point of view of the whole. But, although an immanent or intrinsic teleology such as is characteristic of Plato and Aristotle would have been altogether congruous with Stoic principles, the Stoic appeal to order and adaptation often descended to externality and anthropocentrism, such as are found in the Socratic teaching in the *Memorabilia*. Thus it was said that the peacock was made for the sake of its beautiful tail, and the ass to carry man's burdens.

If the *Memorabilia* is possibly influenced by Stoicism, Cicero's *De Natura Deorum* indubitably is. It is there that the famous reference to the *Annals* of Ennius occurs: as well believe that a copy of it might be reproduced simply by tossing together innumerable alphabets of letters as believe that a fortuitous concourse of atoms could produce this ordered and beautiful universe.¹ There also the inference to God from the order and beauty of the universe is eloquently set forth in a well-known passage²—reminiscent perhaps of Plato's story of the Cave—attributed to Aristotle in the dialogue *On Philosophy*, where is depicted the impression that would be made on a race of men whose dwellings had been underground, on their first beholding the

¹ See further P. Janet, *Final Causes*², E.T., 1883, p. 294 ; also Alfred Noyes, *The Torch-Bearers* (1922), "Kepler," pp. 130, 131, for some spirited lines in this connection.

² Bk. ii.

glorious spectacle of earth and sea and sky.¹ It has been suggested that in the argument for the existence of God contained in the *De Natura Deorum* it is Aristotle we have chiefly before us ; for example, the comparison, in several passages, of the world to a furnished or inhabited house or an adorned and decorated temple of the gods (a comparison which is to be found also in writers like Philo Judæus and Minucius Felix, the Christian apologist) is said to have come from Aristotle.² This suggestion, as we are now ready to see, is odious to those who are jealous for the purity of the Aristotelian doctrine of the end, especially as Cicero in the *De Natura Deorum* furnishes the prototype, in the ancient world, of Paley's *Natural Theology* and the Bridge-water Treatises.

Before leaving the ancient period, we should take note of another work influenced by Stoicism and itself remarkably influential upon subsequent Christian thought, namely, the anatomical treatise, *On the Uses of the Parts of the Body of Man*, by the physician GALEN of Pergamum, who was court attendant upon the Stoic Emperor, Marcus Aurelius. Here the Aristotelian principle, "Nature does nothing in vain," receives a much more rigorous application than it received at the hands of Aristotle himself. Aristotle admitted imperfections in the animal world, such as rudimentary organs, but Galen discovers perfection of structure and adaptation to end or function everywhere in man's bodily organism ; and not only so, the perfection of the human body is regarded by him as a clear and convincing evidence of Deity. I suppose the argument from design or

¹ The passage is quoted in a work which should not be forgotten by those who are interested in the restatement of the argument from design, namely, C. J. Shebbeare's *The Challenge of the Universe*, 1918.

² J. Hutchison Stirling, *op. cit.*, p. 170 ff.

final causes had never been more confidently stated before, nor has it been since ; and it may be true, as C. Singer ¹ has recently affirmed, that, by removing all motive for further observation of the uses of parts, Galen's teleological theory marks the expiration of the observational activity of the ancient world.

II. THE MEDIÆVAL PERIOD.—All through the Middle Ages, in Christian and Muhammadan countries alike, the Aristotelian teleology dominated philosophical and scientific thought. Unfortunately it was the Aristotelian teleology according to a one-sided interpretation—namely, as explanation by final causes apart from mechanical causes—and it laid an arrest upon the movement of natural philosophy. Yet Archimedes and others who came after Aristotle had shown that mechanics at any rate could dispense with the hypothesis of final cause.

THOMAS AQUINAS, as we should expect of one who had inherited the Platonic-Aristotelian philosophy, makes use of the theistic argument from final causality, the so-called teleological proof, and he quotes as exponents of it John of Damascus and Averroës on Aristotle's *Physics*. There is an intelligent "somewhat," says Aquinas, by which all natural objects, inanimate as well as animate, are ordered in relation to an end, and this "somewhat," which must be supernatural, we call God ²—which, indeed, is the gist of the teleological argument, whether in its popular or in its more philosophical forms.

III. THE MODERN PERIOD.—The transition from ancient and mediæval to modern thought is well illustrated, in this matter of teleology, as in others, in the views of GIORDANO BRUNO. His whole philo-

¹ In *Science, Religion, and Reality*, p. 114.

² *Summa Theol.*, I. ii. 3.

sophy represents an attempt to combine in a unitary system the Platonic and Aristotelian idealism and the modern mechanical view of nature, of which Democritus was the precursor. In the spirit of Empedocles he affirmed that only, as it were, after repeated experiments on nature's part did combinations of elements arise which, as being adapted to ends, conserved their stability. At the same time he affirmed—and here the idealistic strain appears—that there is a world-soul, or inner principle of motion in nature, which is purposive in its working, and so orders all things as to secure the world's progress. Thus the mechanical and teleological views are united in this thinker. There was “an unconscious symbolism,” says Whitehead, in his execution in 1600, the year which may be said to have ushered in the first century of modern science, for “the subsequent tone of scientific thought has contained distrust of his type of general speculativeness.”¹

Though FRANCIS BACON may also be said to belong to the age of transition, he was more definitely on the side of the modern scientific movement. It would appear that he looked upon the philosophies of Plato and Aristotle as “plants of lighter and less solid wood” than the physical philosophies of ancient Greece lost in the wreckage of the Roman Empire. For him philosophy was restricted to the investigation of nature, as it may have been for Aristotle in his last period, and there were certain “idols of the tribe,” or common prejudices, to be dismissed from the mind if nature was to be explained or interpreted aright. One of these was interpretation by final causes. Under the illusion that man is the measure of things (which Protagorean utterance, curiously enough, is actually become the watchword of a recent philosophical

¹ *Science and the Modern World*, p. 2.

movement) we interpret things in reference to ourselves (*ex analogia hominis*) instead of universally (*ex analogia universi*). Yet, while Bacon rightly condemns the search for final causes in their signification of designs as useless and even more than useless in physical science, he does not reject the reality of final causes in this signification, acknowledging their place in the philosophical view of the universe, and thus conserving the metaphysical and religious interests that were bound up with the Platonic and Aristotelian teleology. Final causes in physics are, in his famous saying, sterile like Vestal virgins; and, worse than that, they are "impertinent," and intercept "the severe and diligent inquiry of all real and physical causes," giving men "the occasion to stay upon these satisfactory and specious causes, to the great arrest and prejudice of further discovery. For this I find done not only by Plato, who ever anchoreth upon that shore, but by Aristotle, Galen, and others, which do usually likewise fall upon these flats of discoursing causes." On the other hand, the truth of final causes is allowed: "The cause rendered, that the hairs about the eyelids are for the safeguard of the sight, doth not impugn the cause rendered, that pilosity is incident to orifices of moisture. . . . Nor the cause rendered, that the firmness of hides is for the armour of the body against extremities of heat and cold, doth not impugn the cause rendered, that contraction of pores is incident to the outwardest parts, in regard of their adjacence to foreign or unlike bodies." And further, the value of final causes, when kept within their own province, is recognised. They have their place in metaphysic and religion, and indeed the wisdom of God appears more admirable "when nature intendeth one thing and providence draweth forth another."¹ Thus Bacon throws

¹ Cf. *De Augm.*, iii. 4, 5 (*s.i.*).

off the two thousand years' yoke, and touches hands with Democritus and Leucippus across the centuries. But he failed to appreciate the scientific importance of the Aristotelian concept of organisation in biology, as also—but this was the legacy of the schools—the philosophical depth of the essential Aristotelian doctrine of the end.

HOBBS, following Bacon, tried to liberate philosophy from the Platonic and Aristotelian ideas and forms and to substantiate the mechanical view on a materialistic basis not only in the realm of nature but in the realms also of mind and society. He reduced all cause to motion, and philosophy to a doctrine of motion. "Whatever exists is matter, whatever changes is motion."

Though DESCARTES also dispensed with final causes in nature, he did not fall like Hobbes into materialism. He explained natural phenomena by the mechanical principles of matter and motion, so founding the now orthodox systematic view of mechanics, but he dissociated himself from the ultimate positions of the ancient atomistic philosophy. Mechanical explanation was not ultimate explanation. But his rejection of final causes in nature was on theological rather than epistemological grounds. We may legitimately enough, he thought, attribute ends or purposes to God, but we cannot hope to discover these, as they are hidden "in the inscrutable abyss of His wisdom."¹ It is a position which many would endorse in our day. Here, then, as in Bacon, there is a clear distinction between the scientific and the metaphysical and religious interest in final causes—a distinction which became clear only in the modern period of thought.

The most vigorous, as it was the most unpromising attack upon final causes in nature came

¹ *Meditations*, iv.

from SPINOZA. In explaining a particular phenomenon we cannot, he said, go beyond the particular attribute of the one divine substance, be it the attribute of thought (*cogitatio*) or of extension (*extensio*), under which the phenomenon appears to us. For, while the attributes are parallel to each other, there is no interaction between them. Thus material phenomena, including the movements of the human body, are explainable only in physical terms. Matter cannot be grounded in mind. There can be no ends or purposes in nature. "All final causes are merely fabrications of men."¹

Apart from the incompatibility of the doctrine with his fundamental philosophy, two main objections are urged by Spinoza against final causes, that is, in their reference to design or intention as distinguishable from their reference to order and position. The first is Bacon's objection—that acceptance of final causes hinders the investigation of nature : recourse to the will of God in the explanation of natural phenomena, and in particular of outward phenomena like tempests, earthquakes, and diseases, is "a refuge of ignorance" (*asylum ignorantiae*).² The secrets of nature are with those who abandon final causes and place their trust in mathematics, which, as dealing with the essences and properties of things, leads to rational knowledge. The other objection is that the method of explanation by final causes encourages false anthropomorphic conceptions of God. A God who works purposively, or towards ends, is subject to fate or necessity and lacks perfection of being. It implies defect in God that He should be in need of anything. Nor have we any right to infer distinctions in the divine nature analogous to the elements of the human mind. The intellect and will we ascribe to God are no

¹ *Ethica*, i. App.

² *Ibid.*, i. App.

more analogous to our intellects and wills than the constellation of the Dog to the animal that barks.

Undoubtedly Spinoza did good service in exposing the weakness and superficiality of the traditional teleology; but it should be observed that, while the denial of teleology as a principle of cosmic interpretation is already involved in the doctrines of substance and parallelism with which he sets out, at the close of his thought a certain light breaks in upon his system. The *amor intellectualis Dei* with which he concludes, is part of the infinite love wherewith God loves Himself, and we may learn from it that with His universe God is well pleased. The ideas of satisfaction and value which are essential to a teleological interpretation of the universe appear to be here conserved.¹

Despite the able efforts of the Cambridge Platonists, such as Cudworth and More, to vindicate for final causes a place in physics, the mechanical view found increasing support, being applied also as against Platonists and vitalists to the phenomena of life; and it was left to LEIBNIZ to attempt a reconciliation of the opposing principles of the mechanistic and the finalistic. Leibniz's essential position still meets with great acceptance among scientists, philosophers, and theologians. In nature, he says, everything happens mechanically and at the same time metaphysically, and the source of the mechanical is the metaphysical. This position finds clear expression in two sayings that may be placed side by side—one from a recently discovered fragment, and the other quite familiar: Everything throughout nature can be explained both by final causes and by efficient causes (*Omnia in tota natura demonstrari possunt tum per causas finales, tum per causas effici-*

¹ A. S. Pringle-Pattison, *The Idea of God*, p. 333.

entes); Efficient causes depend on final causes (*Causæ efficientes pendent a finalibus*).¹

In biology, as in physics, Leibniz advanced the teleological problem. He is said to have established the truth that biological organisation is compatible with the mechanistic theory, but in comparing the organism to a kind of "divine machine" or "natural automaton" he still comes short of the Aristotelian teleology.

While Leibniz was as "corpuscular" as Descartes or Spinoza in the explanation of particular phenomena, he could not, for two reasons, rest in the mechanical explanation. One reason appears in his metaphysical construction of the concept of substance. Rejecting the Cartesian and Spinozan opposition of matter and mind, of extension and thought, and affirming substance to be force (*un être capable d'action*)² and force substance, he passed from an abstract to a more concrete monism. Matter was no longer to be defined as extension but as a form of force, more specifically as power of resistance; and mind was no longer to be restricted to the sphere of consciousness, and was represented as comprising subconscious states (*petites perceptions*).³ With this view of substance, and with the aid of the Aristotelian principle of continuity and development, Leibniz at length reached the speculative position that the real world consists of an infinite host of independent monads or individuals, at countless different stages of development, whose activity is fundamentally spiritual or perceptual. Now it is the very nature of the monad to strive after the realisation of all its latent possibilities. It has to rid itself

¹ *Epistola ad Bierlingium*, 1711 (Gerhardt's edition, vii. 501).

² *Principles of Nature and of Grace*, 1714, s.i. (Latta's *Leibniz*, p. 406); cf. *New Essays*, 1704 (Latta's *Leibniz*, pp. 370, 397, etc.).

³ *Monadology*, 1714, § 21.

of confused perceptions and attain true ideas, and so to enter into the mind of God the Supreme Monad, an end which may only be achieved on the plane of self-consciousness and spiritual freedom. So it is, according to Leibniz, that the forces active in mechanism may be interpreted from the standpoint of teleology. Everywhere in nature purposive activity may be discerned. Take but the inward view, or, better, take but the universal view, and the world of physical causes and effects becomes a world of means and ends.

The second reason that led Leibniz to uphold the teleological interpretation of the world starts from his postulate of "pre-established harmony," which is intimately connected with his monadology. Though independent or "windowless," each monad "mirrors" the rest of the universe. Though subject to its own laws, each monad is in harmony with the universal development. Geulincx¹ and Spinoza² had already applied the principle of harmony or correspondence to the two Cartesian attributes, but Leibniz applies it to the totality of substance. He compares the correspondence he has in view to different bands of musicians who may keep perfectly together without seeing or even hearing one another. He compares it also, using a frequent analogy of his age (and with the relation of body and mind chiefly in view), to two clocks³ so skilfully made as never to get out of time. The pre-established harmony is not imposed upon the world from without, but belongs to the inner life of the monads; none the less it needs to be explained. The only possible explanation is to be found in the will and purpose of God. It is God alone who brings to pass the union or interconnection of substances whereby the world is orderly and rational. Thus the order of

¹ See Latta's *Leibniz*, p. 331, note 3.

² *Ethica*, ii. 7.

³ *Third Explanation of the New System*, s.i.

the world, interpreted as a pre-established harmony, necessitates the teleological inference to God.

The principle involved in the teleological inference is named by Leibniz the principle of determinant or sufficient reason, namely, that nothing can exist or be true without a sufficient reason why it should be so and not otherwise. Without such a principle, implying the complete rationality of existence, philosophy would for Leibniz have ceased to be, as indeed for Descartes or Spinoza. But Leibniz gave the principle a characteristic application. He regarded it as the foundation of the contingent truths of natural science, just as the principle of identity and contradiction was the foundation of the necessary truths of mathematics and logic. Thus, according to the principle of sufficient reason, the conservation of force or energy and the equivalence of cause and effect in the world must be teleologically explained as dependent upon the divine wisdom and order.

In the eighteenth century, when RATIONALISTIC THEISM flourished, Leibniz's theology was more influential than his monadology. There appears to be a certain looseness of connection between the two, and it was accentuated by Wolff's effort to systematise and popularise the master's doctrine. In Wolff the harmony of the world is no longer an immanent order, but an order externally imposed by God ; and the world's chief end is utility and advantage for man and beast—especially utility for man. This externalism, whose antecedents we have traced in the ancient world, impressed itself upon the "popular philosophy" that arose in Germany about the middle of the eighteenth century, and it promoted a remarkable and many-sided growth of natural theology, or teleological physics and organics, the aim of which was to multiply the evidences of design in nature in the interests of the teleological inference to

creative wisdom and benevolence. There were astro-theologies, litho-theologies, phyto-theologies, insecto-theologies, ichthyo-theologies, and numerous others. As among the Stoics, the ideas of advantage and utility were often beaten out into petty trivialities (*Nützlichkeitsskrämerei*).

In France, Fénelon had already written eloquently on natural theology on similar lines, although later the materialism of d'Holbach and the scepticism of Bayle were to cut at the root of the popular teleology, and Voltaire was to pour contempt upon its anthropocentrism and shallow optimism.

In England, too, natural theology was early developed on the lines of a superficial utilitarianism, beginning in the seventeenth century with the works of the naturalist Ray (on whom Milton drew in *Paradise Lost*), and of Boyle, Barrow, and Parker, continuing with Derham and many others through the eighteenth century, and receiving classical exposition in Paley's *Natural Theology* (1802). So exhaustively had the teleology of nature been discussed that the Scottish divine, Thomas Chalmers,¹ in the first Bridgewater Treatise, turned to mental as distinct from physical teleology, discoursing on the adaptation of nature to mind and on adaptation within the mind itself; while McCosh² laid the emphasis upon moral teleology, inferring from the moral order a moral Governor.

Notice should here be taken of a universal view of teleology held by the English Deist Shaftesbury, who rose above the particular views that so largely prevailed in the Deistic as in the orthodox circles of his time. His was an æsthetic teleology; for in the

¹ *On the Power, Wisdom, and Goodness of God as manifested in the Adaptation of External Nature to the Moral and Intellectual Constitution of Man*, 2 vols., 1833.

² *The Method of Divine Government, Physical and Moral*, 1850.

beauty and perfection of the world he found a proof of the existence of God. Not only does the unity of the world point to a universal Spirit, but beauty lies not in matter but in form or formative power, which must work with design.

The speculative sincerity of DAVID HUME was probably not so great as his speculative genius. In the *Treatise of Human Nature* (1739-40) he reduced the world to a mere complex of phenomena—not an ordered complex, which could be ascribed to a divine Author; and yet in his theological writings, notably in the *Dialogues concerning Natural Religion* (1779), we find him apparently assuming order and purposiveness in the universe. If the tendency of recent interpretations of the *Dialogues* is to be trusted, we may even regard Hume as sincerely adhering to what is there called a “genuine theism,” and as accepting the essential core of the argument from design as its rational basis. We may hear Hume himself speaking through Cleanthes, the rationalistic theist, when it is maintained that at every turn we are obliged to have recourse to the hypothesis of design in the universe; or through Philo, who is sceptical and naturalistic in tendency, when he admits that all objections to the hypothesis of design appear mere “cavils and sophisms” to those who realise the beauty and fitness of final causes. /

None the less, the criticisms of the teleological inference which are put in the mouth of Philo are of great historical interest and importance. Cleanthes, who states the theistic argument from design (round which the discussion of natural religion in the *Dialogues*, as in Paley, mainly turns), compares the world of order to a great machine, subdivided into an infinite number of lesser machines, which, even in their most minute parts, are all adjusted to each other with marvellous accuracy. This universal

adaptation of means to ends so resembles the products of human contrivance that we are led by all the rules of analogy to infer that the Author of nature is somewhat similar to the mind of man, though possessed of much larger faculties. Philo replies, in Hume's own sceptical vein, that the principle of analogy is not a sure basis of argument, especially as we depart the more from the similarity of the cases. Can we really speak, for example, of analogy between the fabric of a house and the generation or vegetation of the universe? And why should thought, design, intelligence be made the model of the whole? If it is valid to say that, because the world resembles a machine (a watch or a knitting-loom), it arose from design, is it not at least equally valid to say that, because the world resembles an animal or a vegetable, it arose from generation or vegetation? And why go beyond nature in search of a transcendent cause? To take one step beyond the mundane system is to be forced to go on in an infinite progression. For the ideal world, into which the material world is traced, is itself to be traced into another ideal world, and so on. May it not be that there are forces in nature by means of which, even after a botching and bungling of many worlds throughout an eternity, this orderly and harmonious system was struck out? At most the argument from design can only prove the existence of a being in time and space, fashioning a given material, and all pretension to ascribe infinity to the Deity, or even perfection in His finite capacity, must be renounced. Can we even pretend to decide from the phenomena of nature as to whether the Deity is one or many? (A similar reference to the limitations of the argument is found in the *Enquiry concerning Human Understanding* (1748), in which the criticism is in the form adopted and made famous by Kant.)

By the objections thus urged by Philo a strong

impression is made upon Cleanthes (as upon many a reader of the *Dialogues* since), who is also led to admit, in view of the problem of evil, that the Deity might be described in the terms of "benevolence, regulated by wisdom, and limited by necessity"—an old position of the Greek theology or philosophy with which we have been familiarised in recent thought. The carefully formulated conclusion of the *Dialogues*, that (as Philo says) "the cause or causes of order in the universe probably bear some remote analogy to human intelligence," may not have represented in Hume's mind the whole of "genuine theism," but it dealt a destructive blow to the rationalistic theology of his time, with its deistic implications, its often petty teleology, and its hedonistic view of life.

On the scientific or philosophical side, however, Hume made a positive contribution to the problem of natural teleology. As we have seen, he gives expression in the *Dialogues* to an idea which goes back as far as Empedocles and is expounded in Lucretius, that in nature the principle holds of the survival of the fit. Described as the tendency towards equilibrium or equilibration,¹ it is recognised in modern physics and biology as teleological in character; but, when Hume speaks of it further as perhaps originally contained in matter, he at least suggests the idea that there is a deeper and more original teleology in nature than ordinary mechanistic theory suspects. So that with Hume the teleological appearance of nature is perhaps more than a postulate of the reflective or subjective judgment, as we saw that it is with Kant.

In his early work on *Universal Natural History and Theory of the Heavens* (1755), KANT acknowledged the great value of the arguments drawn from the

¹ Cf. p. 174 of the present work.

beauties, harmonies, and perfections of the universe, and more particularly of the starry heavens, to establish the existence of a supremely wise and powerful Creator. At the same time he rises above the popular teleology. In a later pre-critical work on *The Only Possible Proof of the Being of God* (1763), he declares himself impressed with the physico-theological¹ argument, but, like Hume's Philo, he doubts the validity of the inference to a Creator who is perfectly wise and good. In the *Critique of Pure Reason* (1781 and 1787) a similar criticism appears, with a famous tribute to the physico-theological argument as "the oldest, the clearest, and that most in conformity with the common reason of humanity." The argument at the best, however, cannot take us beyond the great power and wisdom of the Author of the universe; and it can prove, not a Creator, but no more than an Architect, who is necessarily limited by the character of his material. Clearly Kant must have been acquainted with Hume's *Dialogues* by the time that he published the first *Critique*. For the rest, the physico-theological argument is not a pure induction from experience but originates, says Kant, in the propensity of the human mind to view the order and purposiveness of nature as though they were the products of intelligence and design—a propensity for which, on the principles of the critical philosophy, there can be no real basis. Perhaps, as suggested above, this is a more radical attitude to the teleological interpretation of the universe than Hume would have adopted.²

In the course of his examination of the critical philosophy, HEGEL dealt with Kant's view of the

¹ This term is said to have originated among the Cambridge Platonists.

² For Kant's criticisms of the classical "proofs" generally, see p. 47 ff., also p. 246 ff. of the present work; for his *Critique of Judgment*, see p. 153 ff.

physico-theological proof, just as he dealt with his critique of the teleological judgment.¹ He agrees with Kant as to its inadequacy as a rational or logical argument. The conception of design, like that of cause in the cosmological proof, cannot express the true nature of the relation of the world to God. At the same time the argument represents a further stage, the first stage being represented by the cosmological argument, in the process whereby, in the hidden or implicit logic of religion, thought reaches the full apprehension of God as spirit or self-conscious intelligence. Kant might have allowed this, but for the rigidity of the distinction he drew between the phenomenal and noumenal worlds, which made it impossible for thought to pass from the one to the other. But the distinction is only relative, and from the ultimate standpoint the two worlds are one.

Here we may leave our sketch of the history of universal teleology or of the teleological principle of interpretation. With Hume and Kant the stage is set for our modern discussions, and Hegel reminds us that the effort of a spiritual philosophy that would find hospitality for the teleological view of the universe, must be to overcome the dualism of the Kantian criticism between the phenomenal and the noumenal, between the realm of nature and the realm of ends.

It should also be sufficiently clear that the fundamental question at issue in connection with the concept of purpose is, Are natural processes subordinate to conscious rational purpose, or is the world to be explained and interpreted by mechanical principles alone? On the other hand, it appears from our previous discussions of post-Kantian scientific theory, that, so far as spiritual and theistic philosophies are concerned, the issue in scientific theory, as between mechanism and purpose, is but a subordinate one. To

¹ See p. 157 of the present work.

put the point more sharply, and in relation to that sphere of organic life in which the debate is chiefly maintained, a spiritual or theistic outlook upon nature appears to be consonant either with a mechanistic or with a teleological, that is, dynamistic or vitalistic biology.

Further, it may be allowed to Kant that on strictly logical principles the physico-theological or teleological argument, which he reduces to the argument from design, gives no more at the best than an Architect of the universe (*Weltbaumeister*), sufficiently wise and powerful to produce the results we see around us,¹ and that, to give anything more, it must be eked out with the cosmological argument, or the argument *e contingentia mundi*, which argues from the existence of things which are contingent, that is, which do not necessarily exist, and whose existence therefore constitutes in itself a problem, to the existence of a necessary or self-existent Being on whom their existence ultimately depends, namely, God. Again, it may be allowed to Kant that the cosmological argument leads at the best to an abstract and formal conception of God, as thus viewed in relation to the world as a whole; and that for a richer, fuller, and more satisfying conception it must in its turn be eked out by the ontological argument, or the argument which proceeds from the fact of the notion of a most perfect Being, who, as a most perfect Being, must include within Himself the perfection which we name existence, to the predication of the existence of this Being.

Even so the argument from design rests, according to Kant, upon a hollow foundation. For the cosmological argument, on which it falls back, is fallacious, as based on the principle of causality, a transcendent principle, which necessarily carries us beyond the

¹ Athanasius argued against such a view, maintaining that God is a Creator, not a Carpenter (κτίστης οὐ τεχνίτης); see A. Moore, *Science and the Faith*, 1892, p. xxxi.

sensible world of experience. (It is because natural science is realising the transcendent character of causality that it is more and more banishing the category of causality from its formulations.) Yet, as suggested earlier in connection with the argument from order or design,¹ we need not be deterred from the transcendent inference by purely logical considerations. If the transcendent inference involves an adventure of the mind, it is consonant with the impression which the world makes upon our spirits.

The ontological or Cartesian argument also, on which the cosmological rests in its turn, is regarded by Kant as fallacious. It is admitted, however, by many theistic writers, in this following Thomas Aquinas himself, that it is impossible to give a purely *a priori* proof of theism. The inference from thought or conception to existence appears to them, as to other thinkers, to be almost of the nature of a *tour de force*.² Even so staunch a theist as Clement Webb is inclined to dispute the principle of the ontological argument, in so far as it is maintained that we cannot, without contradiction, conceive of a most perfect Being who does not exist. It is not that he is impressed by Kant's illustration of the dollars in his criticism of the Cartesian proof³ any more than by Gaunilo's of the island in his criticism of the Anselmian proof.⁴ Anselm justly replied to Gaunilo, and Hegel to Kant, that the case of God is different from that of a finite object. A most perfect island is conceivable, but its real existence depends on conditions beyond itself; a hundred dollars is con-

¹ See p. 125 ff.

² "To the ordinary mind it sounds like a logistic puzzle. As dialectic it may be unanswerable, but, like all pure dialectic, it fails to carry conviction" (H. Wildon Carr, *A Theory of Monads*, 1922, p. 101).

³ *Kritik der reinen Vernunft*, A599, B627 (p. 572 in R. Schmidt's edition).

⁴ *Liber pro Insipiente*.

ceivable, but its existence in one's pocket also depends on conditions beyond itself. But in the case of God it belongs to the conception of His eternal and necessary Being that His existence is independent of external conditions. There is point, however, in Kant's objection that the assertion of existence does not add a new predicate to the conception of a thing. There is no more in the conception of a hundred dollars which are in my pocket than in the conception of a hundred dollars which I do not possess at all. A most perfect or infinite Being who does not exist is, accordingly, quite conceivable.

But while we may go so far with Kant, we need not go the whole way. To do so would be virtually to accept the Kantian agnosticism, and to say that we live in an untrustworthy universe. What lay behind Kant's strictures on the ontological argument was his clear recognition that it raised the general question of the relation of thought to reality. On critical grounds he felt bound to assert that thought cannot attain to knowledge of the real. And the ontological argument asserts that in knowledge thought and reality are united. For the thought of God, as defined by Anselm as "that than which nothing greater can be conceived," is just the thought of reality as a whole. While, therefore, the ontological argument, in which the other arguments culminate, is not a proof of the existence of God, in the sense of being a deduction of God from some more general principle, it may be taken as "the assertion of the fundamental nature of knowledge as being knowledge of the Real," "the recognition of what is presupposed in our actual knowledge, that in our knowledge of finite beings as finite is involved a knowledge of an infinite or absolute Reality." ¹

¹ See C. C. J. Webb, *Problems in the Relations of God and Man*, pp. 173-188; *Kant's Philosophy of Religion*, 1926, p. 30 ff.

CHAPTER XVIII

PURPOSE AND THE SPIRITUAL ORDER :

3. THE VALIDITY OF THE CONCEPT

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IN approaching now a positive estimate of the value of the concept of purpose in relation to the spiritual order of nature, I should first seek to defend the conception of a spiritual order in the natural world, and more especially the validity of the notion of purpose in relation thereto. The way should then be prepared for a critical estimate of the notion of purpose as applied to the spiritual order. To vindicate the idea of the spiritual order of nature as distinct from the scientific order is to vindicate the place of religion in the world of thought ; the place of science in the world of thought needs no vindication—nor, for that matter, the place of religion in the world of life.

It would appear that, when the scientific mind would emancipate itself from the tyranny of natural law, that is, of natural forces, and rise into the freedom of the spiritual order of nature in which religion lives and moves, it tends, when unsatisfied with traditional religion, to follow one of two courses. On the one hand, it may seek to deepen its view of the world, and may come to rest upon the pantheistic conception, regarding even the individual human soul as but part of a great world-soul. As Spinoza said, " Out of the eternal substance all individual forms of existence are constantly emerging, and, like waves upon the ocean, they are as constantly sinking back into and being absorbed by it, as the common

stream of universal life." And undoubtedly the way of pantheistic reflection, and in particular the pantheistic view of nature, ministers to the emotion of the ideal or spiritual, in which for many a modern mind religion consists.

It has been remarked of Shelley and Wordsworth that, divergent as were their attitudes to science, they were at one in refusing to be restricted in their view of nature to the mechanistic concepts of science; and doubtless many a man of science makes the same refusal in a similar sense. Turning from the "distortions of vision" which natural science induces and compels, he views nature as a whole, synoptically—in Goethe's phrase, "Kernel and shell and all together,"¹ and in all the parts he feels the brooding spirit of the whole, "a sense sublime of something far more deeply interfused." With many another, wise or simple, he discerns "the light that never was on sea or land"; he yields himself to nature's hidden potencies.

On the other hand, there is another religious point of view which may afford the scientific mind, when it reacts from the traditional theistic religion, an asylum from the tyranny of nature's uniformity. It is not in this case a deepening and sanctifying of its view of the outer world through pantheistic absorption—it is an actual escaping from the outer world, with which it is so much preoccupied, and a bending of its eyes into the innermost depths of the soul's own being. This is to seek the mystic Presence. This is to commune with the mysterious Beyond that is within. And this intuitive way, this way of mysticism, also ministers to the emotion of the ideal or spiritual, which—as above remarked—constitutes

¹ "Natur hat weder Kern
Noch Schale,
Alles ist sie mit einem Male."

religion for many a modern mind. There are those who can yield themselves to the secret life of the universe; and there are those who resort more readily to the fountain-heads of the heart.

Now the ways of pantheistic reflection and mystical intuition each emphasise a truth belonging to the spiritual order of nature which the traditional theism has been inclined to neglect or ignore, namely, the immanence or residence of God in the world of His creation. The traditional theism has been largely deistic in outlook, laying stress upon the notion of the transcendence of God, that is, His distinctness from the world, and making little of the notion of His immanence, that is, His indwelling presence, whether essential or dynamic, whether as substance or as power and purpose. To put it otherwise, God's separateness from the world has been so stressed as to become separation. God is represented as above all things, not so much in the sense that He is greater than the world, as not being exhausted or absorbed by it, which is transcendence in the true theistic sense, but in the sense that He dwells apart from the world in the seclusion and self-sufficiency of His own perfection. The deistic God having made the world and endowed it with motion, leaves it to itself, interposing—if interposing at all—only on occasions.

But what I wanted to lead up to was this, that if the scientific mind, when it cannot rest upon the received religion, tends either to a pantheistic or a mystical faith, to a faith in either case in which divine immanence in the world or the soul is recognised and acknowledged, it is no wonder if we find it turning with a great impatience from the deistic theology under which, chiefly, the argument from design was conceived and elaborated. If the concept of design or purpose is to be applicable to the spiritual order of nature, it must be interpreted in a manner

consistent with the profounder view of God's relation to the world of nature and of man which is implied in pantheism or mysticism. This, of course, modern theism endeavours to do. While it holds by the idea of divine transcendence, that is, of God's separateness from or independence of the world, it seeks also to do justice to the divine immanence, that is, God's sustaining, directing, and controlling providence.

Before, however, we deal critically with the concept of purpose as a principle of interpretation in the spiritual order of nature, we must justify the conception of a spiritual order in nature. Here the primary issue is between naturalism as a philosophical or metaphysical theory, which has no place for such a notion as purpose, in the ontological or ultimately real sense, and some form of idealistic or spiritual philosophy. It is the essence of naturalism to construe all the phenomena of life, of mind, and even of society in terms of the mechanical conceptions which admittedly serve in physical science, and may serve also in the sciences of life and mind and even society, and in terms of such conceptions alone. But this is surely to fail to account for large tracts of experience. Mechanism, which is an undeniably excellent methodical principle of science, and which as such may even lie at the very roots or foundations of the natural order, is at the same time not the last word in philosophical explanation.

Nor, as already observed, is the last word in philosophical explanation given by that profounder or completer type of mechanism which is advocated on the empirical or scientific side by Lloyd Morgan,¹ and which is named by him naturalism. Nor, as we may add here, is it given by that yet profounder or completer type of mechanism which is advocated on

¹ See pp. 213-216 of the present work.

the empirical or scientific side by J. S. Smuts,¹ and which is named by him "holism." (General Smuts conceives of evolution as a process in which, in both the inorganic and the organic world, there is a continuous making or creating of "wholes" on ever higher levels—it is a universe of "whole-making." On the empirical or scientific side the theory is related to the creative or emergent evolution of Lloyd Morgan, S. Alexander, and Julian Huxley, though General Smuts regards the "holistic" as the fundamental aspect of the universe, and creativeness or the emergent new as but one feature of "wholeness.") It has ever been the contention of teleologists from Aristotle downwards that meaning and purpose underlie all material and mechanical processes, that mind or spirit is ideally prior to matter and more fundamental to reality. Naturalism, it may be said, ignores the distinction implied in Lotze's remark, that "the machinery which produces the image of a phenomenon is not identical with the meaning of this image."² But, if I mistake not, none of the writers above-named claims to have given the last word in philosophical explanation, that is, through his theory or philosophy of evolution. In any case it is our opinion that mechanism, emergence, holism, are but ladders or stairways to ultimate reality. They may describe or explain scientifically the phenomena of mass and motion, of organic life, and even of mind or consciousness, but they fall short of an adequate interpretation of the world of nature in its totality. It is the fault of naturalism—that is, of mechanism as a philosophical or metaphysical dogma—that, as A. S. Pringle-Pattison says, it prematurely closes the record of things and events, that it substantiates the antecedents in abstraction from their consequents.

¹ *Holism and Evolution*, 1926.

² *Kleine Schriften*, iii. 229.

“ There is no system, no whole of being, no real fact at all, till the external gathers itself up, as it were, into internality, and existence sums itself up in the conscious soul.”¹

In his *Naturalism and Agnosticism* James Ward argues as against naturalism for an idealistic or spiritual philosophy which, unlike naturalism, may find room for such a real concept as purpose, and he begins with the conscious soul. Here the issue between naturalism and idealistic or spiritual philosophy is raised in its clearest form as the issue between naturalism and theism, and the demurrer of naturalism to theistic inquiries is first dealt with. Insisting boldly with Kant that the mind makes or fashions, though it does not create nature, that it organises though it does not originate nature, he holds that the fundamental principles of knowledge have entered anthropomorphically or humanistically, *ex analogia hominis*, into our conception of nature. Take the conception of the unity of nature, which is a fundamental principle of knowledge. What is it but an ideal counterpart of the actual unity of each individual experience? Or take the conception of causality in nature, another fundamental principle of knowledge. What is it but the interaction of self and environment, of subject and object, transferred to universal experience and represented as interaction between object and object? Or take the conception of regularity in nature, yet another fundamental principle of knowledge. What is it but the outcome of social intercourse and co-operation translated into terms of universal law? Thus our conception of nature as one, subject to causality, and uniform or regular, is built up on the analogy of our human experience; in other words, it is anthropomorphic or humanistic in its origin. In Baconian

¹ *The Idea of God*, p. 215; cf. also p. 332.

language it is an *anticipatio mentis*, while being at the same time an *interpretatio naturæ*.

Josiah Royce says that the universe is endlessly engaged in the spiritual task of interpreting its own life, with man its creature as the interpreter, and that the very existence of the sciences, and of the happy inventive power which has made their progress possible, is a sign of this.¹ Or, to cite A. S. Eddington, who upholds the thesis that mind is a greater instrument than was formerly recognised in prescribing the nature and laws of the external world as studied in physical science: "Where science has progressed the farthest, the mind has but regained from nature that which the mind has put into nature. We have found a strange footprint on the shores of the unknown. We have devised profound theories, one after another, to account for its origin. At last, we have succeeded in reconstructing the creature that made the footprint. And lo! it is our own."²

If, then, nature is conformable to the human mind and intelligence, it suggests to us the idea attributed to Kepler, found also in Bruno, that we think God's thoughts after Him. And not only is nature conformable to the human mind and intelligence, it is also amenable to human ends. We seek to utilise nature for our own practical purposes, and nature responds, does not betray. This recognition of the intelligible by the intelligent, this greeting of the spiritual by spirit, is what idealists or spiritualists have always contended for, and points to the conclusion that nature, metaphysically viewed, is itself subject to Mind—a theistic position.

Thus we may say, if we may trust this line of

¹ *The Problem of Christianity*, ii. 416-418.

² Quoted in *Cambridge Readings in the Literature of Science*, 1924; see also *Science, Religion, and Reality*, p. 217.

thought, that all experience is rational, that our reason is confronted and determined by universal reason, and that the demurrer of naturalism to theistic inquiries is not sustained.

If, then, we live in a spiritual universe, if we belong to an order of nature which is ultimately spiritual, in which spirit or mind is ideally prior to matter and more fundamental to reality, it follows that from the interpretation of such a universe the concept of purpose, so fundamental and characteristic among mental concepts, cannot be ruled out as invalid. The validity of the concept of purpose is in fact involved in the refutation of naturalism on epistemological grounds.

But whether we find this line of argument convincing or not, it should be kept clearly in view, in connection with this point of the validity of the concept of purpose as a principle of philosophical or religious interpretation, that interpretation in terms of Mind and Purpose is, or should be, frankly anthropomorphic or humanistic. It rests upon the general principle of analogy, and is itself a particular instance of this general principle. And, as Leibniz said, all metaphysic is founded on analogy. Apart from the analogy of human experience, no kind of knowledge would be possible, and it is entirely reasonable to proceed by way of that analogy to the consideration of the truly and ultimately real. According to the theistic view, the world is to be interpreted after the analogy of the purposive and purposeful life of which man is conscious in himself. This is a principle of theistic method which has always been more or less recognised by theism itself, and since Hume and Kant the analogical character of the concept of purpose has been widely recognised.

We see it in Lotze, for example, in whom science

and philosophy, which since Leibniz and Kant had been going separate ways, meet once more. For he combines the mechanical view of nature with a teleological metaphysics (which he holds Schelling also did), making it his aim to show, as he expresses it in the well-known Introduction to the *Microcosmus*, "how absolutely universal is the extent and at the same time how completely subordinate the significance which mechanism has to fulfil in the structure of the world." In his scientific materialism he was at one with the great body of scientific thinkers of his age. In his speculative teleology he had affinities with Leibniz, Spinoza, Kant, and Herbart. Following Leibniz, he was led to conceive of the world as a plurality of real spiritual elements, but in mutual interaction according to the principle of immanent as distinguished from transeunt causality. In his endeavour to account for the causal relation and the reciprocal interaction of the elements, he was led, by a similar process of thought to that which Spinoza went through, to the idea of a universal all-embracing principle, which for religion has the value of God. Under the influence of Herbart and the Kantian criticism, he utilises the principle of human analogy in interpreting the inner reality of nature, which he regards as the instrument of a purpose, namely, the purpose of supreme good, though it is by a practical conviction rather than a logical or rational process that we pass from the world of things and forms to the world of values.

We may also see in Bergson that the analogical principle is fully recognised, being employed along with the principle of intuition.¹ With him, however,

¹ Cf. H. Höffding, *Modern Philosophers*, E.T., 1915, p. 290 ff. (see ref. at p. 292 to *Den menneskelige Tanke*, French ed., pp. 318-327).

the category of end or purpose is applicable only to the lower scientific order of nature. It is the category of life that is applicable to the higher order, which is spiritual or at least vital. None the less, it may be urged that in representing life as an *élan*, a thrust, an effort, an urge, he actually operates in his speculative theory with the principle of analogy. In this instance the analogy is drawn, not—as in that radical Leibnizian finalism which Bergson condemns as but an inverted mechanism, likewise making time useless—from the intelligent self-conscious experience, but from the spontaneous and semi-conscious psychical experience. And it may properly be contended, as against Bergson, that the analogy of personal life, self-conscious and self-determining, offers a better clue to the nature of the absolute experience than does any analogy based on experience of a sub-personal sort. This is in accordance with the principle of interpretation by the highest form of experience we know, and the highest form of experience we know is the rational self-conscious activity of personal individuals. As Canon Streeter puts it, “If the hypothesis of a Universal Life is demanded to explain the fact of life, then the hypothesis that in that Universal Life there is intelligence is required to explain the fact of reason.”¹

While this has been said in defence of the *analogia hominis*, one cannot but acknowledge the influence of the Bergsonian concept upon contemporary philosophy and theology. To cite two very recent instances. Critical as he is of Bergson's theory of evolution, in particular of his theory of the creative function of the intellect, General Smuts offers us a philosophy which has close affinity with Bergsonism on the speculative side. Critical as he also is of Bergson's theory of evolution, in par-

¹ *Reality*, p. 125.

ticular of his theory of a life-force which is purposive but purblind, Canon Streeter offers us an interpretation of the universe in terms of life, in which creative evolution is combined with an idealist philosophy.

CHAPTER XIX

PURPOSE AND THE SPIRITUAL ORDER :

4. CURRENT USE OF THE CONCEPT

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So far, then, in defence of the position that the concept of purpose, derived from the *analogia hominis*, is a valid principle or mode of philosophical and religious knowledge. Let us now consider the use made of the concept in current philosophy.

We have seen that naturalism repudiates purpose as a real, that is, ontological category. As for logical pluralism of the type exemplified by B. Russell, it tends to be suspicious of metaphysical teleology, being preoccupied not with the subject of experience, to which the category of end or purpose is primarily applicable, but with the object of experience, and more particularly with the provision of a logical basis for exact science.¹ And we must allow that in this it fulfils a useful and necessary task, however much we may deprecate its positivist reduction of the scope of philosophy ; inasmuch as "inductive data fall upon us from all sides like the lava of Vesuvius ; we suffocate with uncoördinated facts ; our minds are overwhelmed with sciences breeding and multiplying into specialistic chaos for want of synthetic thought and a unifying philosophy." ²

If naturalism would banish the concept of purpose from philosophy, pragmatism would allow it no more than that logical validity which is allowed to it in scientific theory. Indeed, pragmatism claims to be

¹ Cf. C. A. Richardson, *Spiritual Pluralism*, 1919, p. 17.

² W. Durant, *The Story of Philosophy*, p. 102.

different from other philosophies in respect of the clearness of its consciousness that teleology is no more than a methodological postulate. Where pragmatism has advanced beyond the sphere of epistemology, it generally professes, as we are told, a view of the universe, a *Weltanschauung*, which is pluralistic in a spiritual sense, or, as it is otherwise phrased, radically empirical, and will have nothing to do with the ancient and mediæval view of the universe as teleologically constituted for the satisfaction of human desires and needs.¹ But it does not on that account repudiate the idea of divine Purpose. It employs it as a hopeful assumption—to be justified by results, I suppose—in the interpretation of the universe, as a likely instrument in the hands of philosophical and religious reflection. Its teleology is heuristic. It is unwilling, if I may put it so, to say that all metaphysic *is* founded on analogy; it is content to say all metaphysic *may* be so founded.²

A contrast may be here indicated between the naturalism or logical pluralism of Bertrand Russell³ and the pragmatism of F. C. S. Schiller, in so far as it affects their respective attitudes to teleology. For the first the universe is blind to good and evil and indifferent to human interests; for the other the universe may be the sphere of divine Purpose. Perhaps it is the preoccupation of logical pluralism with the objective side of experience that leads it to look upon the notion of teleology with doubt and suspicion. But, more likely, the attitude arises out of a personal conviction or resolution of character.

When we pass from pragmatism, an essentially epistemological type of philosophy, with its hopeful

¹ Cf. J. M. Warbeke, in *Journal of Philosophy, Psychology, and Scientific Methods*, 1919, xvi. 207, "A Medieval Aspect of Pragmatism."

² Cf. F. C. S. Schiller, *ibid.*, xvi. 548, "Methodological Teleology."

³ *Philosophical Essays*, 1910, p. 60 ff.

endorsement of the idea of divine Purpose, we come to full-orbed systems of philosophy, and we notice that in personalistic or humanistic systems the idea of divine Purpose is actually, and not merely provisionally, endorsed. It is, in fact, the fundamental effort of such systems to vindicate the principle of human analogy and to apply it to the determination of the ultimate reality. Sometimes such systems may be non-theistic, sometimes they may be of a theistic type, and when they are of a theistic type they are amply hospitable to the concept of purpose.

Consider how thoroughgoing an application of the concept is embodied in personal idealism, or spiritual pluralism of the theistic type. It conceives reality, as in the monadisms of Leibniz and Lotze, as consisting of a plurality of experiencing subjects or spiritual centres of experience. In this it builds upon the analogy in respect of purposiveness between human persons and the lower forms of organic life, and upon the conjecture that even inorganic matter is composed of purposive individuals. Like organic species arrested in their evolution, or apparently so, these exhibit the minimum of spontaneity and the maximum of habit, according to the idea expressed by James Ward, "Routine presupposes antecedent living purpose."¹ The essential nature of the monads or spiritual individuals is affirmed to be their self-activity (conscious, subconscious, or unconscious) in reference to ends. Thus spirit and spontaneity, which naturalism banishes from the world, are restored on this panpsychist hypothesis throughout the whole vast range of experience. But that coherent experience may be made possible, a sympathetic *rapproch* or responsive sympathy is, as with Lotze, postulated among the monads.

¹ *Proceedings of the Aristotelian Society*, 1911-12, p. 260; cf. also C. A. Richardson, *Spiritual Pluralism*, p. 53.

With this, the theory of personal idealism advances from its pluralistic base to its final theistic position, in which the World-Ground, as well as the whole range of experience, is teleologically conceived. Sympathetic *rapprochement* implies unity in the plurality, and unity implies a unifying principle, and the unifying principle is best stated not in the abstract terms characteristic of absolutist systems but in terms of that conative unity, that striving after the realisation of ends, which is given at once in the most simple and the most complex individual experience ; and in terms, moreover, of conscious and self-conscious activity, according to the teleological principle of the interpretation of the lower by the higher. Further, if we describe the World-Ground as an ultimate self-conscious Will, we are not to think of it, as in absolute idealism, as a purely immanent principle. Though God gives unity or system to the plurality of monads, He is not Himself the unity in which they subsist. There is a principle of distinction in a self-conscious mind, in virtue of which it belongs to itself and does not merely enter into other selves.

The map of reality consists then, according to this theistic argument (I have expounded it on the line of G. Galloway's treatment in his *Philosophy of Religion*),¹ of simple monads interacting within a common medium or environment, which is grounded in a transcendent self-conscious Will. It is claimed that the theory offers a better key to the understanding of unity and individuality than absolute idealism or natural realism can supply. It is a bold attempt at any rate (and this is our particular point) to justify the teleological view of the universe on metaphysical grounds. Whether it yields too much to the voluntaristic psychology, I do not pretend to judge ; but I appreciate its consistency

¹ 1914, c. xi.

with the theism of the moral and religious consciousness, in which the teleological character of things and events is felt and appreciated. "At the heart of religion and morality," says Siebeck, "is the feeling that the existence and development of the world is not an indifferent matter, but is designed to realise a highest Good."¹ When, therefore, ethical theism, with its religious conception of God as the absolutely Good, is set beside the metaphysical theism of the pluralistic approach to reality, it seems possible to state a conclusion in terms such as these. First, in the language of philosophy: Though individual existences and personal spirits have a being for themselves and are variously endowed with spontaneity, the development of experience remains in the control of the World-Ground. Then in the language of theology: Though the actions of the creature are not absolutely foreordained or predestinated, but manifest spontaneity and freedom in various degrees, they fall within God's providential government. Or in the language both of philosophy and theology, and in Galloway's concluding words: If the world have its Ground in a self-conscious and ethical Will, which comprehends and sustains all the individual centres of experience, faith in a Providential order of things is sufficiently justified.²

But to many the panpsychist hypothesis involved in personal idealism does not appeal. They cannot reconcile themselves to a theory which transforms the physical phenomena into mental or psychical phenomena. Accordingly, while remaining personalists or humanists in the sense of adhering to philosophies determined by the principle of the human analogy, they approach the theistic conclusion by a

¹ *Ueber Freiheit, Entwicklung, und Vorsehung*, 1911, p. 45 (quoted by Galloway, p. 439).

² *Op. cit.*, pp. 447-449.

different way from that of panpsychism. A recent example of another type of personalistic theism is to be found in J. E. Turner's *Personality and Reality* (1926). This writer seeks to combine Hegelian idealism with a realistic view of the universe, based upon modern psychology and physics. He conceives of the universe as a psychophysical entity. In the mechanism of matter a transcendent mind is expressed, and the essential character of mechanism is its inherent and indispensable fixity of organisation. But the material universe continually evolves, and, apart from an immanent or dominant mind, the evolution of mechanism would be a contradiction in terms. It is by the dominant mind, whose essential character is plasticity (a manifestation of transcendence), that the aforesaid fixity is overcome. The actual evolution of mechanism is due to its manipulation by the dominant mind in accordance with its own evolving concepts. Such a mind is a Supreme Self—supreme in its absolute dominance, a self as being analogous to human personality, although infinitely above it. The Supreme Self, it is added, is as such “existentially identical with its own primary purposes.”

Turner would distinguish this theistic argument from the classic and familiar argument from design by naming it the argument from automatic mechanism. I have more than once expressed my concurrence in the view that the deistic presuppositions of the argument from design were favourable to the “mechanistic dogma.” But here an argument for the real existence of a Supreme Self is actually founded on the mechanical scheme of the universe. Materialism and naturalism, it is said, regard the absence of any directive mind as the only logical implication of the perfect mechanism of the natural world, neglecting the equally logical and much more reason-

able alternative of the presence and dominance of a directive mind. This dominance of mind is, however, concealed by the supreme complexity and automatic or autonomous character of the mechanism itself. For the higher the directive or originaive mind the more automatic and complex the mechanism which is the indispensable instrument of its effective action, and the more complex and automatic the mechanism the more difficult for a lower intelligence to discern the presence and dominance of the directive mind. Just as a self-acting machine conceals from the simple intellect of a savage or a young child the existence and nature of the mind to which the mechanism as a mechanism is wholly due, so in the experienced universe the directive or originaive mind is concealed through the very expansion of its own instrumental mechanism. In the argument from design it is usually said that the greater the manifestation of design in the material world, the more clearly is the dominant mind revealed; in this argument, operating with the principle of automatic mechanism, it is said that the more perfect the working and the more intricate the character of the mechanism, the more effectively is the dominant mind concealed.

While the existence of design in the actual world is not here emphasised, but rather the universal method of autonomous mechanical structure and activity, it should be observed that mechanism is none the less interpreted in terms of design. Not so much design in the artistic or static sense, of which the old argument tended to make so much, in which the world presents the appearance of an architect's plan, as design in the purposive or dynamic sense, such as is embodied in a piece of machinery or in an ordered social system like an army battalion. It is in this latter sense of the term we may speak of an

embodied or immanent design in the universe which is subordinate to some design that transcends the ordered system ; so that I suppose Turner might say that design or purpose in the universe is immanent and patent, and at the same time transcendent and latent. The dominance of mind in evolution implies the immanence of the Supreme Self ; and the perfection of the automatic physical mechanism, whereby it maintains the evolutionary process of itself, implies the transcendence of the Supreme Self.

CHAPTER XX

PURPOSE AND THE SPIRITUAL ORDER :

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HAVING considered the place which the concept of purpose holds in some current philosophico-religious systems, we turn finally to a critical estimate of it in relation to the spiritual order of nature. It is one thing to uphold the concept, another thing to conceive of it *sub specie æternitatis*.

While the category of purpose is in this reference a theistic category, it is recognised by theistic writers that it must be dissociated from finite limitations. Thus in his volume, *The Nature of Deity* (1927), a sequel to *Personality and Reality*, J. E. Turner would make the point that Purpose in itself does not necessarily imply defect or imperfection in the Deity. Even in finite selfhood, or on the lower levels of personality, we may observe how purpose becomes with self-development more definite and effective, an ever higher manifestation of power and capacity. Indeed, as selfhood becomes increasingly dominant, purpose undergoes that "transmutation" of which F. H. Bradley speaks, "so that there arises the final existential identity between the self and its purposes." Or, to put it otherwise, "The highest type of purpose . . . is an attribute of fully developed selfhood—that is, in actuality, of Deity."¹

The category of purpose, when used with reference to the spiritual order, is then a theistic category, and as such must be liberated from the imperfections

¹ P. 84 ff.

of finitude. But there are theisms and theisms. Some, as already indicated, are more hospitable to the notion of purpose than others, and some employ the notion too facilely. In this respect the deistic type of thought presents an easy target for criticism. It is the type of thought, as we may recall once more, that enters into the teleology or physico-theology of the Bridgewater Treatises, which found the power, wisdom, and goodness of God to be impressed in detail upon the natural creation. A critical consideration of the deistic teleology should help us further to clarify our conception of divine Purpose.

In the deistic view the world is regarded as a sphere of divine Purpose, but the divine Purpose is, as it were, imposed upon the world from without. This may be put technically, in the statement that the deistic view of the world is "hetero-telic." Obviously such a conception makes against a unitary view of things, as J. S. Mill realised. In the traditional argument from design, where the setting is deistic, the divine Artificer, as in Xenophon's *Memorabilia* or Cicero's *De Natura Deorum*, fashioned the world to its present form out of an already given matter; or else, as in the ecclesiastical doctrine endorsed by Paley, the matter was first created out of nothing by divine power, then shaped by divine wisdom and beneficence. But such an initial dissociation of matter and form is inconceivable, and has indeed been "as much a bugbear as a chimæra."¹ The idea of external adaptation of the world to divine ends should be replaced by the idea of internal adaptation. God is not beyond or even alongside His world, says a truer theism; He is within it as immanent Life, Will, Intelligence.

It was its emphasis upon contrivance, with external adaptation of means to end, as a theological

¹ J. Ward, *Realm of Ends*, p. 70.

concept, that brought discredit upon the old argument from design. Theologising in science, as we have more than once observed, is apt to put an arrest upon the scientific study of nature ; and the historical protest of Bacon and Spinoza against the theological doctrine of final causes, as sterile and unfruitful, a refuge of ignorance, was amply justified. And Darwin gave a fatal blow to the notions of an external designer or contriver and of special external adaptations, when he affirmed the doctrine of descent by natural selection. Even if natural selection is repudiated as *the* or even as *a* principle of organic evolution, what Darwin himself said remains true : “ We can no longer argue that the beautiful hinge of a bivalve shell must have been made by an intelligent being, like the hinge of a door by a man.”¹ That does not mean that the teleological inference is necessarily false ; it only means that “ before we can use the speech of the teleologist we must learn to use the glasses of the evolutionist.”²

I should like to add that in the sphere of history, as in the sphere of nature, the deistic teleology is also superficial and inadequate. Its language, if not inappropriate in the world of concrete relationships in which religion lives and moves, can hardly be literally applied in philosophy. It looks upon God as a moral Governor who imposes His laws upon men after the fashion of an earthly potentate. But, says a truer theism again, the divine laws are not externally imposed, but are immanent in man’s heart and conscience ; and the divine providence is not exercised *ab extra*, but is an immanent righteousness working in and through free human agency.

“ Was wär’ ein Gott, der nur von aussen stiesse,
Im Kreis das All am Finger laufen liesse ! ”

¹ *The Life and Letters of Charles Darwin*², i. 309.

² V. F. Storr, *Development and Divine Purpose*, p. 126.

Externality was not the only defect which may be attributed to the deistic flavour of the old argument from design. There were associated with the notions of contrivance and special adaptations certain views of cosmic purpose which are, to say the least, one-sided. Such was the hedonistic idea that all things were intended to minister to the happiness of the creatures. As against this we must now set the fact of natural selection, of the struggle for existence and the survival of the fittest, even though the struggle may not be so grim in reality as Huxley portrayed it, and even though the ear of the naturalist may detect in it an "ethical undertone." One-sided also was the hedonistic idea that all things are intended to minister to human happiness. All is designed, says, as we found, the Socrates of the *Memorabilia*—and he has had many successors—towards the one end of man's advantage and well-being. This is a position that lends itself readily to extravagance, as when it is said that the forests are turned into coal to provide man with fuel; a position, too, that lends itself readily to caricature, as when it was said—by Hegel, was it not?—that the cork tree was made in order to provide man with stoppers for his bottles! ¹

Even Kant, let us note in passing, was sometimes "as fanciful as any Paley could wish," ² and that not merely in his pre-critical days. We have seen that in the *Critique of Judgment* (1790), one of his later works, design or purpose tends to lose its external character as an analogue of art and to become, as it were, internalised as an analogue of life, or, in other words, to take on a meaning applicable not so much to mechanism, to which design or purpose is

¹ See also P. Janet, *Final Causes*², Appendix viii. ("Abuse of Final Causes").

² J. Ward, *A Study of Kant*, 1922, p. 111.

necessarily external, as to organism, in which design or purpose is internal, as in the Aristotelian conception of the end. Yet in that selfsame work he speaks of vermin as a wise appointment of nature to promote cleanliness, of mosquitoes as so many goads to savages to drain the marshes and make their habitations more healthy, of disturbing dreams as preventing sleep from becoming the complete extinction of life.

But let us catch up the main thread of our discussion. As we have seen, the finite element of contrivance, with external adaptation of means to end, may rightly fall away from the concept of purpose as applied in connection with the spiritual order of nature to the infinite Experience. No part of the world is then in danger of being handed over, as virtually in "anthropomorphic theism," as deistic theology is named, to mechanical necessity; and the inorganic, in which mechanical necessity appears to hold undisputed sway, becomes with the deepening of the philosophical interpretation, and in particular with the modern theistic emphasis upon divine immanence, essentially related or adapted to the organic, and both inorganic and organic to the whole cosmic process. It is the strength of idealistic interpretation that it can thus dispense in the cosmic reference with the "theistic Demiurge"¹ and associate itself with what has been called an "autotelic" view of the world-process. When purpose is no longer thought of as superinduced in creation and providence upon particular things and events, but is intimately applied to the world in its totality, we learn to appreciate Kant's ideal of nature as a complete teleological system in which for the intuitive or perceptive understanding the distinction of means and end is transcended, and the whole appears as the

¹ B. Bosanquet, *The Principle of Individuality and Value*, p. 133.

unity of its parts and the parts as the differentiation of the whole.¹

If the notions of contrivance and external adaptation are to be dismissed as unduly anthropomorphic, that is, as involving too free or too careless a use of the principle of human analogy, is the notion of a preconceived plan to be retained—a notion which attaches naturally enough to “anthropomorphic theism,” and which indeed provided Paley with his criterion of final causation—or is the so-called plan to be identified with the nature or process of the whole? It would be easier for the personal idealist or theistic pluralist to retain the notion than for the absolutist. It was the conviction that God cannot be regarded, except by the logical imagination, as devising schemes and selecting methods that led Spinoza, from his standpoint of abstract monism or singularism, to repudiate the principle of human analogy altogether and to deny of God the faculties of intellect and will. These, as being exercised in the carrying out of finite plans and purposes, could not be predicated of the eternal Being. There is danger as well as truth in such a position, but what we are here concerned to point out is that Spinoza’s views do not seem incompatible with the essential idea of divine Purpose. He denounces externalism and anthropocentrism, yet he looks upon the world as a significant whole, necessitated indeed, but necessitated by the divine nature itself, which is the nature of the whole. “It is the idea,” says Pringle-Pattison, “of the divine necessity as a self-affirmed life, and not as a blind force acting within the universe like a fate which it undergoes, that constitutes the differentia between a theistic and a non-theistic doctrine.”² And Baron von Hügel, in whose thought there is no strain of

¹ Cf. A. S. Pringle-Pattison, *Idea of God*, p. 328.

² *Op. cit.*, p. 340.

pantheism (he himself reluctantly finds a semi-pantheistic strain in Pringle-Pattison), endorses this position ; without insistence upon the wholeness of the world, theism will never fully escape, he says, "all ultimate Dualism, or final Pluralism, or essential Agnosticism." ¹

It may lend support to Spinoza's objection to the notion of a pre-existent cosmic plan to notice, as we have been asked to do, that the conception of purpose involved in the notion aforesaid is even inapplicable to human action of the highest kind, such as moral conduct or artistic production. The good life is not lived, the beautiful work of art is not produced, according to preconceived plan. In such matters, "realisation and purpose are in principle equivalent to one another." ²

A simple and homely illustration of God's relation to the order of nature may be found in a good speaker's relation to the order of his thought as expressed in words. "Only an ineffective speaker requires to have the order reduced beforehand to words and sentences which he memorises and laboriously and anxiously and perhaps even unthinkingly rolls off from memory." ³

It may also lend support to Spinoza's objection to the notion of a pre-existent cosmic plan to notice that if the course of the world is preformed and pre-determined—as it has been expressed, "the dull rattling off of a chain forged innumerable ages ago" ⁴—there is not much to choose between naturalism and idealism, in particular idealism of the absolutist type.

In this connection it is significant that naturalism

¹ *Essays and Addresses*, Second Series, 1926, p. 143.

² J. E. Turner, *The Nature of Deity*, p. 89.

³ J. Porteous, *Order and Grace*, 1925, p. 82.

⁴ W. James, *Principles of Psychology*, 1890, i. 453.

and idealism, like fatalism and predestinarianism, often meet, and like righteousness and peace, kiss each other. It is also significant that the crusade of spiritual pluralism, in its various forms, against the absolutist systems is for the redemption of the spiritual values sold by them—"treacherously sold," says F. C. S. Schiller¹—into the bondage of naturalism. It is also significant that Bergson rejects radical finalism—such as Leibniz's—as being only an inverted mechanism, as implying that things and beings realise a programme previously arranged, thus making time or real duration (*la durée*), which is the very substance of our world, of no account.

If, then, we abandon radical finalism with its illusion of preformation and predeterminism, shall we say that the history of the universe is the history of a great adventure? ² If we so put it, then shall we say that the adventure is in the experience of the Absolute or in the experience, that is, from the standpoint, of the finite subject? The followers of Bergson, consistently enough with his speculative theory of life—sub-personal life—as the ultimate principle of the universe, say that the adventure is in the experience of the Absolute: the theistic idealist, with another conception of the Absolute, says that the adventure is from the standpoint of the finite subject. There are bounds, however, it is usually said, to the scope of the adventure on the part of the finite subject.

"There's a divinity that shapes our ends,
Rough-hew them how we will."

The theistic universe not only remains under God's control, but is fundamentally ethical. It is

¹ *Humanism*², 1912, p. xxv.

² Cf. C. F. D'Arcy, *God and Freedom in Human Experience*, 1915, p. 217.

the very heart and core of theistic faith that an eternal purpose of good is at work in the world.

"This world's no blot for us,
Nor blank; it means intensely, and means good."

Or, to express it in terms of modern Christian theology, the world is the scene of the realisation of the grand purpose or end of the Kingdom of God. And, accordingly, we are asked to think hopefully of the world in its pursuit of this high quest and adventure.

Kirsopp Lake has put this theistic position eloquently, that the world is the expression of some great and growing purpose of good, of which men are not merely the result but also the instruments or even agents, but only in so far as their actions are consistent with the divine Purpose are these invested with eternal significance: "Life presents itself as a great web which is slowly coming from the loom, and sometimes there seems to be behind the loom the figure of the great weaver; at other times the weaving is being carried on by men and women whose weaving sometimes conforms, sometimes does not, to an infinitely complicated but symmetrical plan which, and here is the paradoxical tragedy, they can only see in the web which has been already woven; but they know that whether what they weave will remain or not depends upon its being in accord with the pattern."¹

It is but to state a complementary side of this faith to affirm that the world must possess value and real existence for the divine Experience, and that into the divine Experience the time-process must accordingly enter somehow. The Purpose which God possesses in Himself is independent of time, which is not, as in Bergsonism, an ultimate reality,

¹ *The Religion of Yesterday and To-morrow*, p. 115.

yet it is somehow connected with the time-process in which it is being realised. How time is retained and yet transcended in God we do not know, nor can we know. But we are not without a clue. In mystical contemplation and in artistic enjoyment the sense of time, we are told, may almost vanish from the consciousness; and it is claimed that the life of the philosopher or artist bears in this respect some kind of analogy to the divine life. It is at least suggestive of the idea for which Pringle-Pattison contends, that purposive activity is the concrete reality and time only the abstract form.¹ If this be so, then Bosanquet's criticism of teleology, in the sense of "aiming at the unfulfilled," is so far met. Such a teleology, he says, gives undue importance to time and to the last term of a time-sequence.² But, says Pringle-Pattison, "The last term is only important because in it is most fully revealed the nature of the principle which is present throughout. It is precisely this linkage of the first term with the last, and, to that extent, the transcendence of the mere time-sequence in the conception of an eternal reality, that seems to me to be expressed by the profound Aristotelian idea of τέλος or End."³

In the theistic view the purpose that may be attributed to the infinite Ground of the universe is to be regarded as conscious purpose. But the question may be raised whether unconscious purpose may be attributed to God as the infinite Ground. On this question Bergson would appear to range himself in the succession of Schopenhauer and von Hartmann, with this difference, that for these last the gates of the future are closed. Undoubtedly the

¹ *Op. cit.*, p. 358.

² *The Principle of Individuality and Value*, p. 135 ff.

³ *Op. cit.*, p. 332.

via media of unconscious purpose avoids the difficulty of explaining how one self-consciousness may exist within another, the finite within the infinite (a difficulty which personal religion does not endeavour to explain, but, as is religion's way, surmounts in practice—*solvitur ambulando*), but it possesses inherent difficulties of its own. It has to account for inorganic arrangement and process, and for the transition from the unconscious stage to the conscious and self-conscious stages of existence ; it has also to explain the reason why the unconscious will or the vital impulse should tend in one direction rather than another. Further, there is the difficulty, noticed earlier,¹ of ascribing real meaning to a phrase so paradoxical as this of unconscious purpose. "If," as W. R. Sorley says, summing up an illuminating discussion, "purpose be admitted as necessary for the interpretation of organisms, and if organisms are held to have arisen out of inorganic material, then there is good reason to postulate that the process which led to organic and purposive life was itself animated by purpose"—not individual nor merely racial purpose, but universal purpose, acting, moreover, not "after the fashion of impulse" but "in the manner of mind or consciousness."²

This theistic postulate of universal conscious purpose is to be justified in face of the problem of evil, including the facts of what Haeckel calls "dys-teleology,"³ and Arthur Thomson "disharmony and other shadows"⁴—imperfect adaptation, disease, parasitism, cruelty, wastefulness, senescence, and death. Yet it appears a more reasonable postulate than that of unconscious purpose, and more hospit-

¹ See p. 227.

² *Moral Values and the Idea of God*, p. 426 f.

³ Cf. *The Evolution of Man*^s, E.T., i. 86-88.

⁴ *System of Animate Nature*, lect. xviii.

able, too, of human experience in the realms of fact and value.¹

The category of end or purpose, when purged of its finite incidents, which would appear to be, in the main, survivals of the deistic type of theology, in which the relation of God to the universe is externally conceived, like the relation of an artist to his picture or of an inventor to his machine, tends to pass into the category of worth or value. In the teleological view of the universe the end, which is the nature of the whole, is an ethical end worthy of being purposed, that is, worthy of engaging the desire and effort of the Absolute.

But may we attribute desire and effort to God? At the outset of his system Spinoza said that to attribute to Him desire and effort would be to imply defect in Him, as though He needed something; but at the close of his system he appears to allow that we may legitimately make the attribution of desire and effort, of what is usually named in psychology conative activity. If, indeed, we are to listen to certain voices among us, we have here, in conative activity, the centrally significant thing in human experience, and thus the very essence of the human analogy, in so far as it is applicable to the knowledge of God. A theism, or even a Spinozan pantheism, which includes the idea of divine desire and effort, may be anthropomorphic, but it is anthropomorphic in a relevant or legitimate sense. May we not say, therefore, that in the infinite Experience conation is present—and if conation, then also its correlative satisfaction. As Bosanquet strikingly puts it, "The

¹ I do not attempt to discuss even the problem of physical evil in these pages. Reference may be made to two recent discussions from the theistic standpoint of the problem of evil in general: E. Griffith-Jones, *Providence—Divine and Human*, bk. iii. (see also bk. ii. c. ii., "Dysteleology"); B. S. Streeter, *Reality*, c. viii. In *ERE*. vol. xii. there is a short article on "Theodicy" by the present writer.

contradiction of conation coexisting with fruition'—that is, in the infinite Experience—"must somehow be realised." ¹

It seems to me that we must say this if the world is to be recognised as truly a "vale of soul-making" in which providence rules and not fate, the concurrence of the living God and not the eternal decree, and in which eternal spiritual values are to be realised. It is my belief that God is ever operative in the process of the world, sustaining, directing, controlling, constituting its order, raising it to ever higher levels, and, in the fulfilment of His eternal purpose, communicating Himself to personal spirits capable of free spiritual response to His Mind and Will.

"All tended to mankind,
And, man produced, all has its end thus far;
But in completed man begins anew
A tendency to God."

Accordingly, the true image of God is not the pre-existent Creator of the deistic theology, nor the static timeless Absolute of acosmic pantheism, but the eternal Redeemer of the religious consciousness.

For the rest, although the theological notion of purpose needs to be purged and purified if it is to be freely used in philosophical reflection, the theistic believer may still retain a rich and full conception of the Deity, even in His relation to the natural world. And when he sets the divine immanence and the divine transcendence in the light of the moral and religious consciousness, which he can hardly forgo doing, nor need he, they acquire a richness and fulness, indeed, a glowing warmth, such as they could not acquire from metaphysical considerations alone. There was a Churchman of the eleventh century, Hildebert of Tours, who sounded deeply the deep

¹ *Proceedings of the Aristotelian Society*, 1911-12, p. 251.

theistic chord, and with his words we may fitly conclude :

“ Above all things, below all things ;
Around all things, within all things.

Within all, but not shut in ;
Around all, but not shut out ;
Above all, but not too high ;
Below all, but not too low.

All above, as the Ruler ;
All below, as the Sustainer ;
All around, as the Protector ;
All within, as the Fulness of Life.”¹

¹ See *Migne*, vol. clxxi. p. 1411.

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